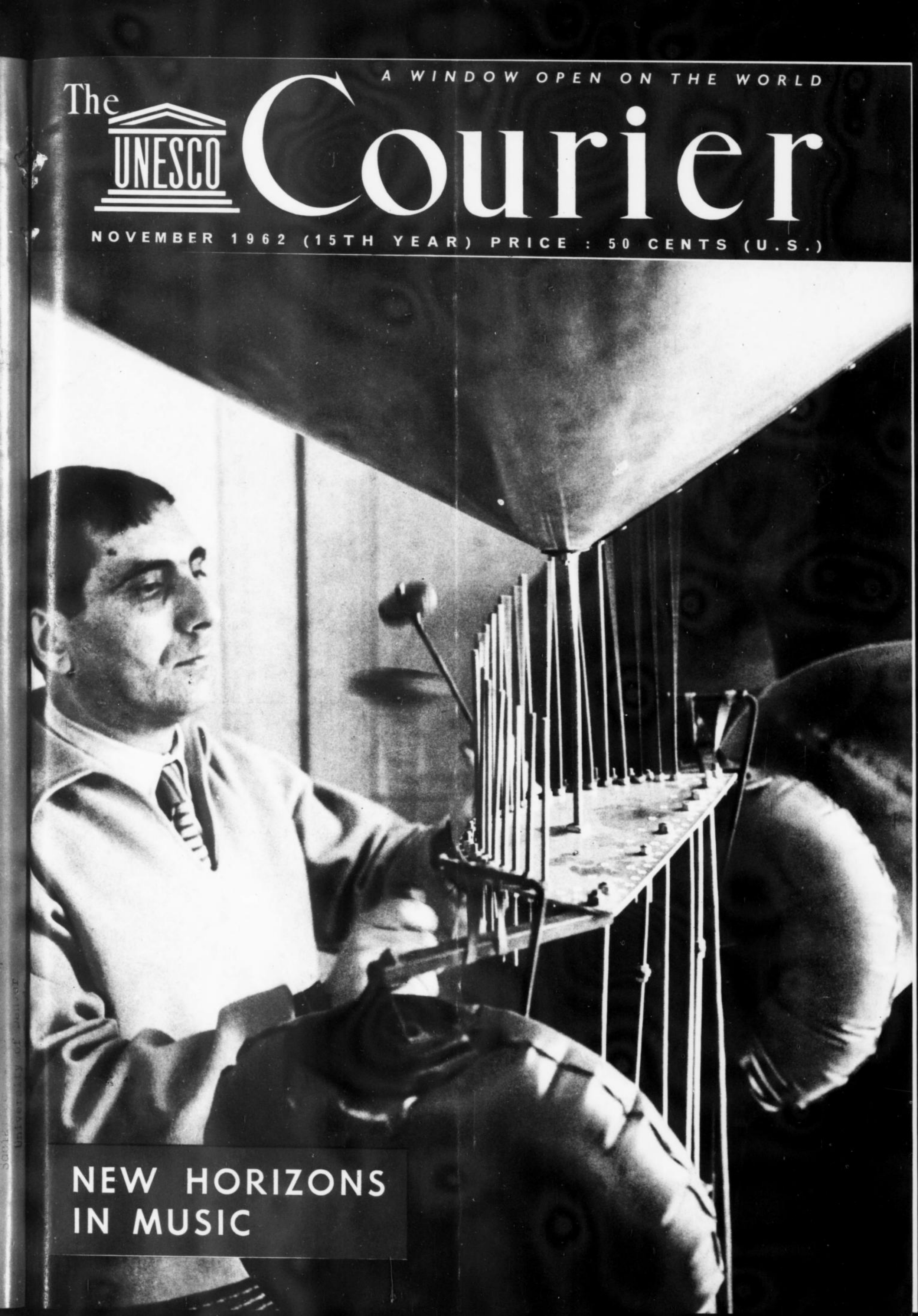
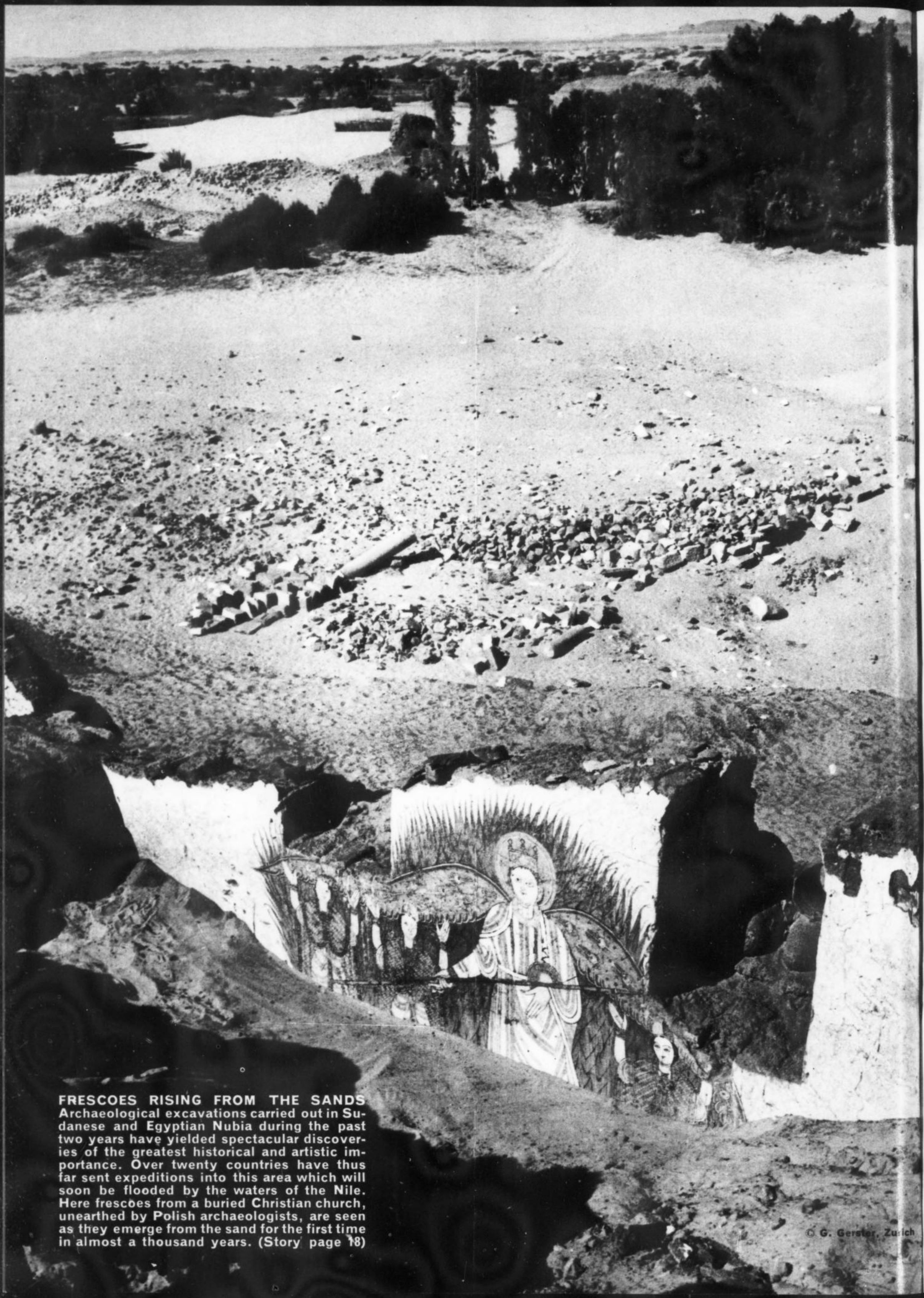
A WINDOW OPEN ON THE WORLD

The UNESCO Courier

NOVEMBER 1962 (15TH YEAR) PRICE : 50 CENTS (U.S.)



NEW HORIZONS IN MUSIC



FRESCOES RISING FROM THE SANDS
Archaeological excavations carried out in Sudanese and Egyptian Nubia during the past two years have yielded spectacular discoveries of the greatest historical and artistic importance. Over twenty countries have thus far sent expeditions into this area which will soon be flooded by the waters of the Nile. Here frescoes from a buried Christian church, unearthed by Polish archaeologists, are seen as they emerge from the sand for the first time in almost a thousand years. (Story page 18)

© G. Gerster, Zurich

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PUBLISHED IN EIGHT EDITIONS

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COVER PHOTO

This strange contraption is one of a number of new musical instruments invented by two young Frenchmen in recent years. The instruments create sounds impossible to achieve on ordinary musical instruments and exemplify present efforts to explore new horizons in the world of music. (See page 12.)

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(M. C. 62.1., 174 A)

Published monthly by
The United Nations Educational, Scientific and Cultural Organization
Editorial Offices
Unesco, Place de Fontenoy, Paris 7e, France
Editor-in-Chief
Sandy Koffler
Assistant Editor
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Associate Editors
English Edition : Ronald Fenton
French Edition : Jane Albert Hesse
Spanish Edition : Arturo Despouey
Russian Edition : Veniamin Matchavariani (Moscow)
German Edition : Hans Rieben (Berne)
Arabic Edition : Abdel Moneim El Sawi (Cairo)
Japanese Edition : Shin-Ichi Hasegawa (Tokyo)
Layout & Design
Robert Jacquemin

THE UNESCO COURIER is published monthly, except in July and August when it is bi-monthly (11 issues a year), in English, French, Spanish, Russian, German, Arabic and Japanese. Sales and distribution: UNESCO Publications Center. U.S.A. 801 Third Avenue, New York 22, N.Y., Plaza 1-3860 (sole distributors of the U.S.A. edition). Second-class mail privileges authorized at New York, N.Y.

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The Unesco Courier is indexed monthly in The Readers' Guide to Periodical Literature.

Annual subscription (any edition): $ 5.00 ; Single copies : 50 cents.

All correspondence should be addressed to the Editor-in-Chief in Paris.

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SOCIETY CALLS THE TUNE

by Peter Lengyel

All art reflects the complexity of the society which produces it. Music, perhaps the most spontaneous of the arts, is no exception and we shall examine here how musical taste and production are related to social structure. Can one learn anything about a culture by listening to its music? I believe that one certainly can, and that the reverse also holds true: one needs to know something about a culture before really appreciating its music.

The history of music goes back to the various folk idioms, which are the collective and mainly anonymous characteristics of certain cultures, or of stages in their evolution. Their origins are not commonly known with any precision, though the effects of certain recorded events can often be clearly distinguished.

Thus typical elements of North African origin in Spanish folk music are a relic of the Moorish occupation of Spain, just as the diffusion of certain modes and phrasings of Mediterranean origin to other parts of Europe bear witness to the passage of the troubadours and trouvères, those wandering minstrels of the Middle Ages who, fanning out from Provence, came to be greatly admired for their accomplishment in distant parts.

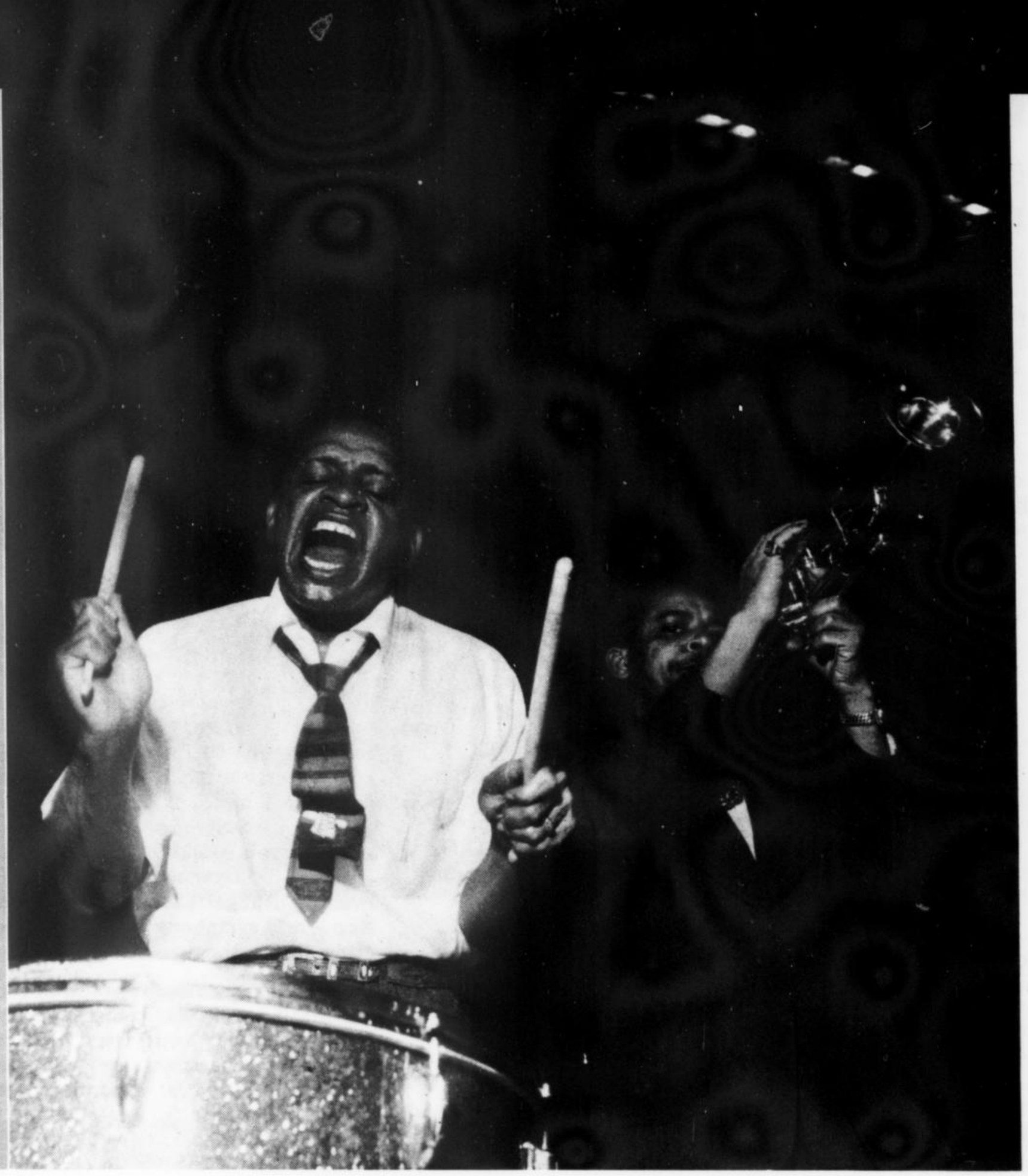
Folk music is essentially traditional and mostly unwritten (except when collected and noted by scholars): like the great Gothic cathedrals or the ancient sagas and myths, it is the result of an accumulation of artistic effort, most of the individual contributions to which are hard to distinguish from each other. No doubt there were important musical innovators who exercised an incisive influence in their day, but their names are lost and it is probable that they were not particularly honoured in their lifetime, for the folk audience did not take a sophisticated interest in art for art's sake.

On the contrary, folk pieces tend to be short and specific to common situations: they might be dances, ballads, songs for festive or special occasions (banquets, lullabies, work songs, dirges), hunting calls or military marches. Also, they are generally intended for performance by the voice or on selected and usually simple instruments, widely available and none too difficult to play.

Melody and rhythm, rather than harmony and timbre, are their outstanding features: "abstract" music, long compositions in complex form and music which calls for considerable technical equipment (whether in the shape of instruments or performing skills) has little or no place in folk music.

Folk musicians rarely had the benefit of formal musical

PETER LENGYEL *is in charge of projects on economic and social development in the Department of Social Sciences of* UNESCO. *For many years he has studied the shifting place of music in social life through the ages in Europe.*



Left, concert in an 18th-century drawing room. Right, jazz drummer Lionel Hampton in action. Jazz, a music in which improvisation plays a major role, has been called a new folk idiom, reflecting as it does many aspects of our time and appealing to the most diverse audiences. The abstract and "learned" classical music of two centuries ago was written for the pleasure and appreciation of a cultured minority audience.

© Jean-Pierre Leloir

training other than that which might be handed down from father to son, nor were they acquainted with a repertory beyond the traditional one. These limitations gave them a simplicity and constancy which their less naive successors could not validly claim. Thus the folk musician strove to encompass the entire gamut of his listener's emotional experience in the only terms available to him. If many cultures never really moved beyond the folk stage in their musical expression, this is an index of their continued homogeneity, separateness and cohesion. Undisturbed in patterns of living and basic values, they reflected such simplicity in their art.

In Europe, as in several other parts of the world, notably in Asia, however, increasing social differentiation brought with it the rise of "learned" or "classical" music. This was distinguished from folk music by being addressed to minority audiences, giving expression to increasingly singular emotions or abstract sentiments and being the product of composers schooled in certain established conventions and techniques. Also, classical music is mostly written, leaving a decreasing amount of latitude to the performer's fancy and introducing a formal distinction between the creative artist (the composer) and the executing artist (the player or singer), which is rare in folk music.

The rise of classical music owed a great deal to the patronage of churches and courts, both of which used it to enhance their prestige and as a commonly acceptable vehicle to convey uncommon concepts. In Europe, the earliest school of classical composers were the Polyphonists, who flourished from the 10th to the 17th centuries and whose art, as the name suggests, lay in the combination of several voices singing different but superimposed melodic lines simultaneously.

Since they were chiefly in the service of the church, the works of prominent Polyphonists, such as Byrd in England, Orlandus Lassus and Josquin dès Près in Flanders, Victoria in Spain and Palestrina in Italy, were typically couched in the form of masses, anthems and motets. Their most important output for profane use were the madrigals, written for amateur domestic performance, of which large collections by various masters are known to us today.

From the combination of several voices singing different parts, the logical development was to have these parts performed by instruments, or by voices and instruments together. It is to this art that the succeeding school of European classical composers—the Contrapuntalists—devoted itself. By this time (the second half of the 17th and the 18th century), two other important developments were also taking place.

Firstly, great strides were being made in perfecting instruments through inventions (keyboard instruments), refinements (string instruments) and technical improve-

CONT'D ON NEXT PAGE

Orchestras for kings, dukes and generals

ments (wind instruments) which not only allowed for hitherto unknown flights of virtuosity in performance but also encouraged the exploration of novel timbres and effects through orchestration.

Secondly, increasing attention was paid to the formal aspect of music as the "learned" tradition took hold: simple two-section (binary) or three-section (tertiary) pieces were supplemented by compositions cast in the more complicated form of fugues or airs with variations.

Such evolution, in turn, reflected the increasing complexity of European society and the widening of audiences and sources of patronage. While the Polyphonists relied chiefly on the church for support, and to a lesser extent on the courts and on educated amateurs, the Contrapuntalists already had wider profane outlets including increasingly wealthy aristocratic circles and the rising middle classes.

Johann Sebastian Bach successively held posts as a choirboy, violinist in a princely band, town organist, chief court musician and cantor of the municipal school of Leipzig. George Frederick Händel speculated in public entertainment with his operas and made a career in Germany, Italy and England.

Most of the Contrapuntalists tried their hand at many kinds of music—choral, instrumental, orchestral, stage, military, ceremonial, sacred—frequently in response to commissions. They were artisans who responded to new demands: in the widening field open to them, they became acknowledged masters of a versatile trade with enlarged horizons for themselves and for their art.

UP to this stage, the folk and "learned" traditions of music in Europe tended to diverge. Learned composers became men of the world who mixed with the upper classes, had access to kings, dukes, popes and generals, and formed as well as shared their tastes. Folk musicians remained obscure, playing to the common people in what came to be regarded as a crude and rustic manner; they did not have great orchestras or choirs at their disposal, nor were they challenged by the theatre, the pomp of state and religion and the demands of talented amateurs. Their idiom was unsuited to the expression of lofty abstractions, like charity and humility, patriotism and loyalty, and they could not compete with their grand colleagues. This state of affairs carried over into the next important period of European musical history, the Classical epoch.

It is true that Haydn introduced German, Hungarian and Slav folk melodies into his music, sometimes for light relief, sometimes with deliberate expressive purpose, while Beethoven gave full symphonic treatment to peasant dances and Schubert derived the *lied* (or art song) from traditional German patterns. Yet these were but episodes, paralleled by attempts to present popular music to sophisticated audiences, such as the ballad operas of the 18th century, amongst which the *Beggar's Opera* by Gay and Pepusch achieved enduring fame.

It was the Romantics of the 19th century who, after an excess of courtly and ecclesiastical discipline, suddenly discovered the as yet untapped sources of folk music which lay all around them and provided material as rich and diverse as it was colourfully attractive to mixed audiences removed from the traditional life.

"Nationalistic" composers, working the vein of folk music and incorporating it into their personal styles, flourished everywhere: Mussorgsky, Borodin, Tchaikowsky and Rimsky-Korsakov in Russia, Smetana and Dvorak in Bohemia, Chopin in Poland, Liszt, and later Bartok and Kodaly in Hungary, Grieg in Norway, de Falla, Granados and Albeniz in Spain, Vaughan-Williams in Britain, and more recently, Enesco in Rumania, Villa-Lobos in Brazil, Copeland and Gershwin in the U. S.

THERE was even a considerable amount of fascination with the folk music of foreign countries. Bizet's *Carmen,* undoubtedly the most popular opera ever written in the Spanish idiom, is the work of one Frenchman, based on a story by a second which, in turn, was adapted as a libretto by two others. Tchaikowsky wrote several pieces incorporating popular Italian airs, as did Mendelssohn, who also used Scottish tunes. Brahms' Hungarian dances are famous; so are Dvorak's *New World* symphony and his American quartet, incorporating Negro themes.

There now occurred a period of convergent development. While folk music was being studied, recorded and worked up by "learned" composers, classical music was also to some extent passing into the popular domain. The operetta is a typical example of musical entertainment which, while cast in a version of the "learned" idiom, appeals to the taste of a public that is not necessarily sophisticated in its musical tastes.

Those who flocked to applaud Offenbach's excellent comedies, or the endlessly tuneful light operas of Johann Strauss might not have been able to tell Berlioz from Rossini, nor cared to do so. But they were equally strangers to pure folk music being, for the most part, city dwellers and members of an industrializing, specializing society, increasingly cosmopolitan, increasingly eclectic, decreasingly linked to their own traditional sectors.

WITHOUT being particularly conscious of the process, the pace-setting elites and their crowds of imitators, had gradually been made familiar not only with elaborations of their home folk materials, but also with exotic elements originating, perhaps, from Africa, the Far East or Polynesia. The process was, incidentally, two-way, for it also acquainted audiences in Tokyo, Cairo or Rio de Janeiro with the musical fashions of Paris, Vienna and Milan.

At the same time, however, true folk music itself began to decline, for it was assailed with increasing strength by an international idiom (the amalgam of several folk traditions, plus an infusion of "learned" styles) which caught the imagination of millions all over the world. Thus, some of the lieder of Schubert, arias by Mozart, Verdi and Puccini, a few instrumental or orchestral pieces as well as a host of airs and dances, from "John Brown's Body" to

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© Paris-Match

PHILOSOPHY OF MUSIC. Today, musicians as well as sociologists are preoccupied with the meaning of music and its future. Above, Olivier Messiaen, the eminent French composer surrounded by his pupils at the Paris Conservatoire Nationale de Musique, where he lectures on the philosophy of music.

STEEPED IN FOLK TRADITIONS. The Romantics of the 19th century suddenly discovered the untapped sources of folk music. Composers in many lands have since worked this vein and incorporated it into their personal styles. One example is George Gershwin's opera, "Porgy and Bess" (recently brought to the screen, and a scene from which is shown below) whose music is steeped in American Negro folk traditions.

Samuel Goldwyn Productions-Columbia

MUSIC SKETCH BOOK

All drawings courtesy of the André Meyer Music Collection, Paris.
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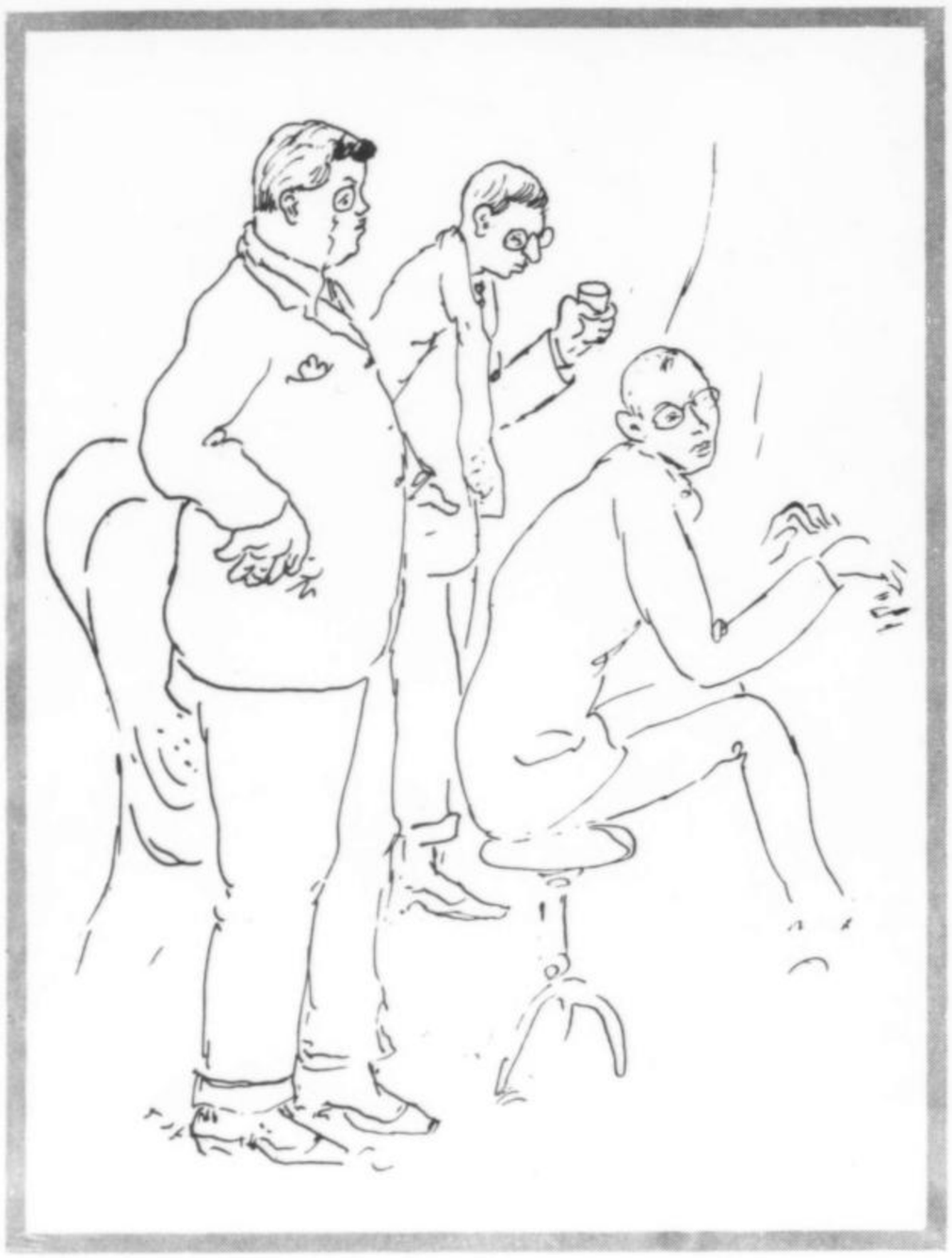
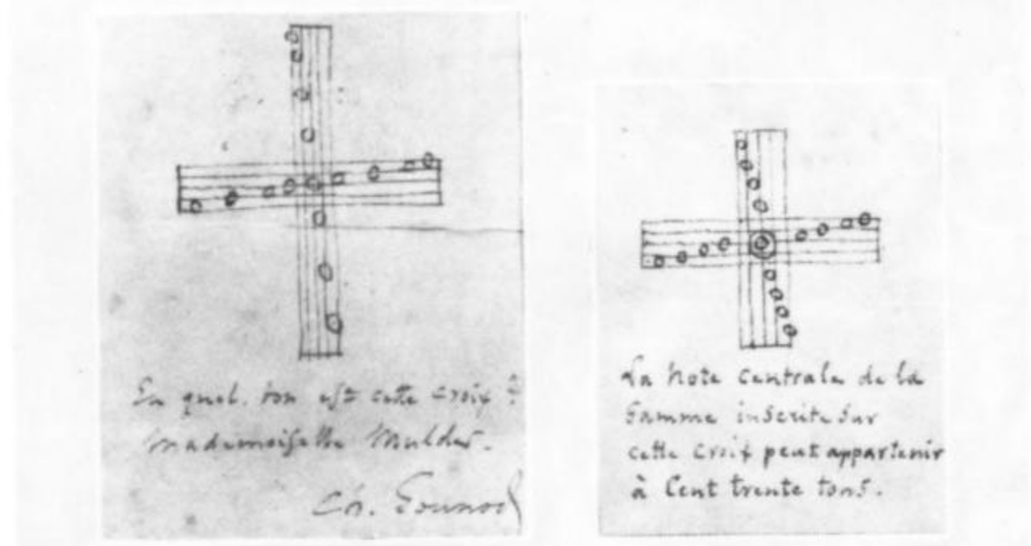


Drawing, above, by Russian artist Larionov shows Serge Prokofiev, at the piano with composer-conductor Igor Stravinsky, (glass in hand) and Serge Diaghilev, founder of the famous Ballets Russes.

Enrico Caruso (left). Self-portrait by the great Italian tenor who was also a skilled caricaturist.


En quel ton est cette croix à mademoiselle Mukle.
Ch. Gounod
La note centrale de la gamme inscrite sur cette croix peut appartenir à cent trente tons.

8 Musical puzzle invented by Charles Gounod which shows that in a given scale arrangement the same note is found in 130 different tones.

Niccolo Paganini (right) composer and one of the world's greatest virtuosos of the violin.

Arturo Toscanini (Italy)

Bela Bartok (Hungary)

Leonard Bernstein (U.S.A.)

CELEBRITIES DRAWN BY AN ARTIST-MUSICIAN

Musician and artist, B. F. Dolbin is an American of Austrian birth now living in New York, who is well-known in America for his drawings and caricatures of celebrated musicians and composers such as the six reproduced here. He has also done hundreds of portraits of great modern figures in the theatre, art, and science.

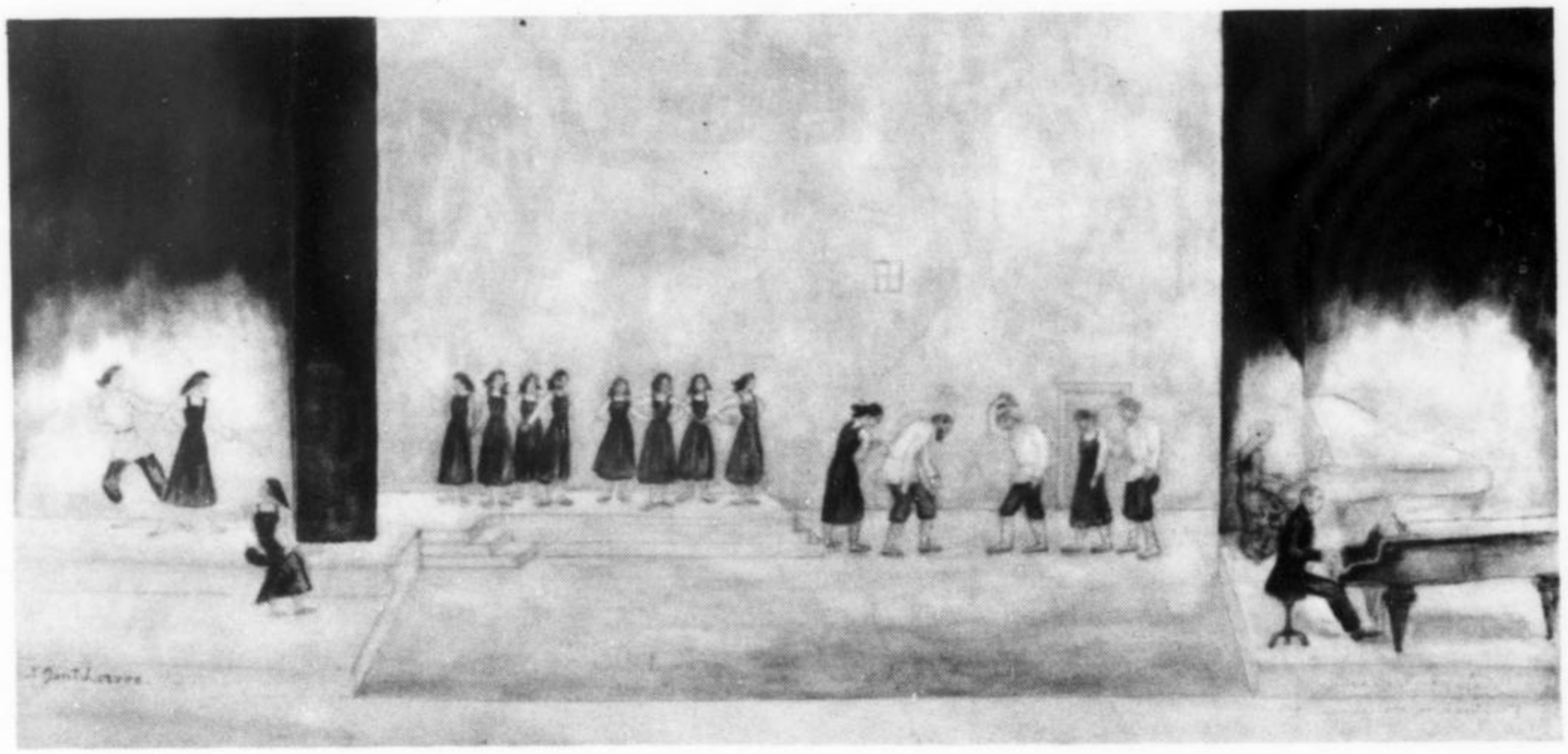
Dimitri Shostakovitch (U.S.S.R.)

Arnold Schœnberg (Austria)

Hector Villa-Lobos (Brazil)

STRAVINSKY BALLET SET

Scene from "Les Noces" one of the ballets written for Diaghilev's Ballet Russe company by Igor Stravinsky. Its premiere was given in Paris in 1923 when this drawing was made by Nathalie Gontcharova, who was responsible for the setting, the curtain and costumes.



The many faces of modern jazz

"Auprès de ma blonde," from the tarantella to the tango. passed into the international cultural patrimony.

Folk music, in the old-fashioned sense of the term. flourishes, if at all, only in regions still shielded from the mainstream of modern life, though mixed forms of it naturally continue to evolve everywhere, and with specially creative vigour in countries with mixed populations, such as Brazil or Israel.

Yet the victory of any single "learned" or semi-learned idiom of music is far from complete. For with the emergence of an international audience, there also arose an industry which sought to cater to as wide a consensus of its tastes as possible. It is often argued that the products of this industry—"pop" songs, dance music, film music, etc.—are hopelessly debauching contemporary musical standards by throwing out immense quantities of a commercial product hastily stitched together from worn and disparate patches.

A captive public, exposed to such music wherever it goes —at the factory, in airports, over television, in restaurants, at parties, in cars—is having its æsthetic responses blunted by a sort of journalese of sound which panders to fashionable fads and exploits the most banal, superficial and conventional reactions of the listener, deliberately avoiding anything that might conceivably displease at first hearing.

The situation today strikes many critics as one where people face only the choice between the remote, intellectualized and difficult work of serious composers and the half-baked, half-heard leftovers which constitute the background to daily activities. One consequence of what has been called "the appalling popularity of music" is to make the effort at communicating something that is at once artistically valid and widely accessible an increasingly delicate task.

J. Gorne, Paris

MUSIC EVERYWHERE. Wherever they go today people have access to music. Music is brought to them constantly by radio, TV, records and loudspeaker systems. "Pop" songs blare out from juke boxes like this one (right) in a Parisian cafe with its teen-age audience. To feed juke boxes, gramophones in the home and disk jockeys on the radio, millions and millions of records are being produced. Above, a gramophone factory worker separates recording plate from matrix with which records will be mass-produced.

BALLET DECOR BY DALI. Ballet with its themes of drama, fairy-tale, fable and life has offered a rich medium for musical expression. Since the time of Lully, the 17th century French composer, often considered as the first to make an art of ballet music composition, many great musicians have combined their efforts with those of choreographers and artists to produce spectacles enchanting equally to eye and ear. Below, a Salvador Dali painting for a backdrop used in a modernistic ballet "Sentimental Colloquy", first produced in New York in 1944 by the Ballet International Company, with music by Paul Bowles and choreography by André Eglevsky.

From "Art in Modern Ballet" by George Auberg, Pantheon Books Inc., New York

© Almasy-Vauthey

There is also the opinion which asserts that an entirely new folk idiom has recently arisen, one that is a characteristic of our age, and as good an expression of its quality, as the folk music of earlier, more circumscribed and simpler cultures. This is jazz. Born of a cross-current of influences—Spanish, French, African, English, Creole, Protestant hymns, military marches—in a country which is itself a melting-pot of cultures, jazz certainly transcends frontiers with amazing ease, and seems to mirror current moods in the most distant places.

Its element of improvisation has about it something of the tentative, episodic and rapid features of modern life. Then, too, the interpenetration of jazz and "learned" music appears significant: if Haydn used folk tunes, a Milhaud, a Kurt Weill or a Stravinsky turn as naturally to jazz, while the ideas of Bartok, Ravel, even of Scarlatti, are not absent from its "progressive" examples.

ATTRACTIVE though it sounds, there are objections to this thesis. For jazz itself is compartmentalized: it has its "learned", "naive" and "commercial" branches, each appealing to a different audience. Those who appreciate the first and second varieties overlap significantly with the audience for classical music, which is hardly true for the fans of the commercial variety, strangers to connoisseurship in any shape.

Furthermore, jazz only expresses *part* of the total range of experience within the cultures of which it is a product. It does not even aspire to express them whole, or to encompass many of their refinements and complexities. Thus jazz has a layered structure, precisely reflecting that of modern industrial communities. One extreme is shoddy, the other esoteric while the middle ground is strewn with soiled remnants.

If we now try to explain what is going on in sociological terms, we may say that, as societies have become more similar to each other at comparable levels, so they have been further differentiated internally. The arts have followed suit. People in comparable situations resemble each other more closely, in their ways of life, their mentality and their emotional make-up which governs taste, while being cut off more completely from those whose experiences are essentially dissimilar, even if they happen to be neighbours.

While this has no doubt always been the case to some extent, its repercussions today are much greater than ever before, more rapid in their impact and on the whole, more deliberately organized. Despite certain appearances, there is a lot of spontaneous segregation in the world based not on force and prejudice so much as on the perfectly legitimate desire to pursue one's own interests and one's own temperamental preferences, which has led to dependence upon indirect and roundabout means of contact rather than on physical propinquity.

What, in these circumstances, is likely to be the future of music? If one can venture a guess on the basis of visible trends, I should say that music will again tend to become somewhat anonymous, something of a collaborative product and that the remaining free-lancers will be mainly concerned with the technological exploration of the frontiers of sound.

Why? Because interest in, and sympathy for the isolated person and his problems is declining, displaced by interest in groups, in associations and in identifiable mass movements. Also, the percentage of musical participants (i.e. amateur or professional performers) is declining in comparison to the total number of "spectators" (i.e. listeners).

The patronage for music is now in the hands of the controllers of the great institutions—the radio, the cinema, recording companies, the state itself—who are forced to think in terms of wide public responsibility and the economics of mass production and marketing. What is more, the unparalleled accessibility of the standard

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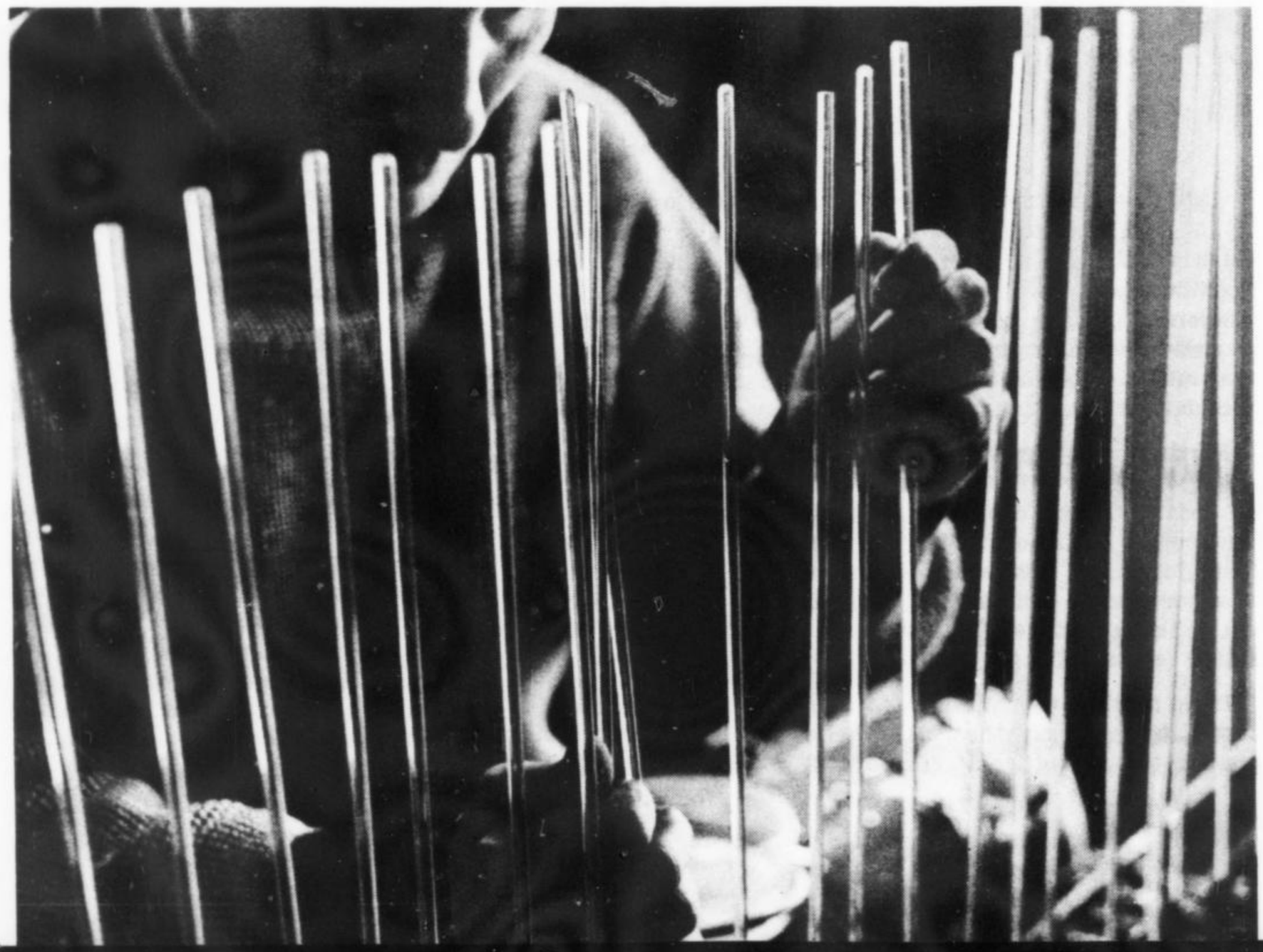
EXPLORING NEW FRONTIERS OF SOUND

In the past half century there have been many attempts to extend the frontiers of the world of music. Musicians have experimented with "concrete music" and new tonal forms of music, and even explored the possibilities of new musical instruments. Photos here show the recent efforts of two young Frenchmen, François Baschet, a stringed instrument maker, and Jacques Lasry, who have invented startlingly new types of instruments which bear strange names such as the "pneumatic guitar", "echo screen", "crystal organ" and the "lameliphone". The crystal organ exists in three tonal ranges, one of which, the deep crystal, is shown on left. It has three sounding boards made of steel or duralumin connected to small crystal rods which the player rubs with wetted fingers. The instrument has been used to play revolutionary compositions and classical masterpieces.



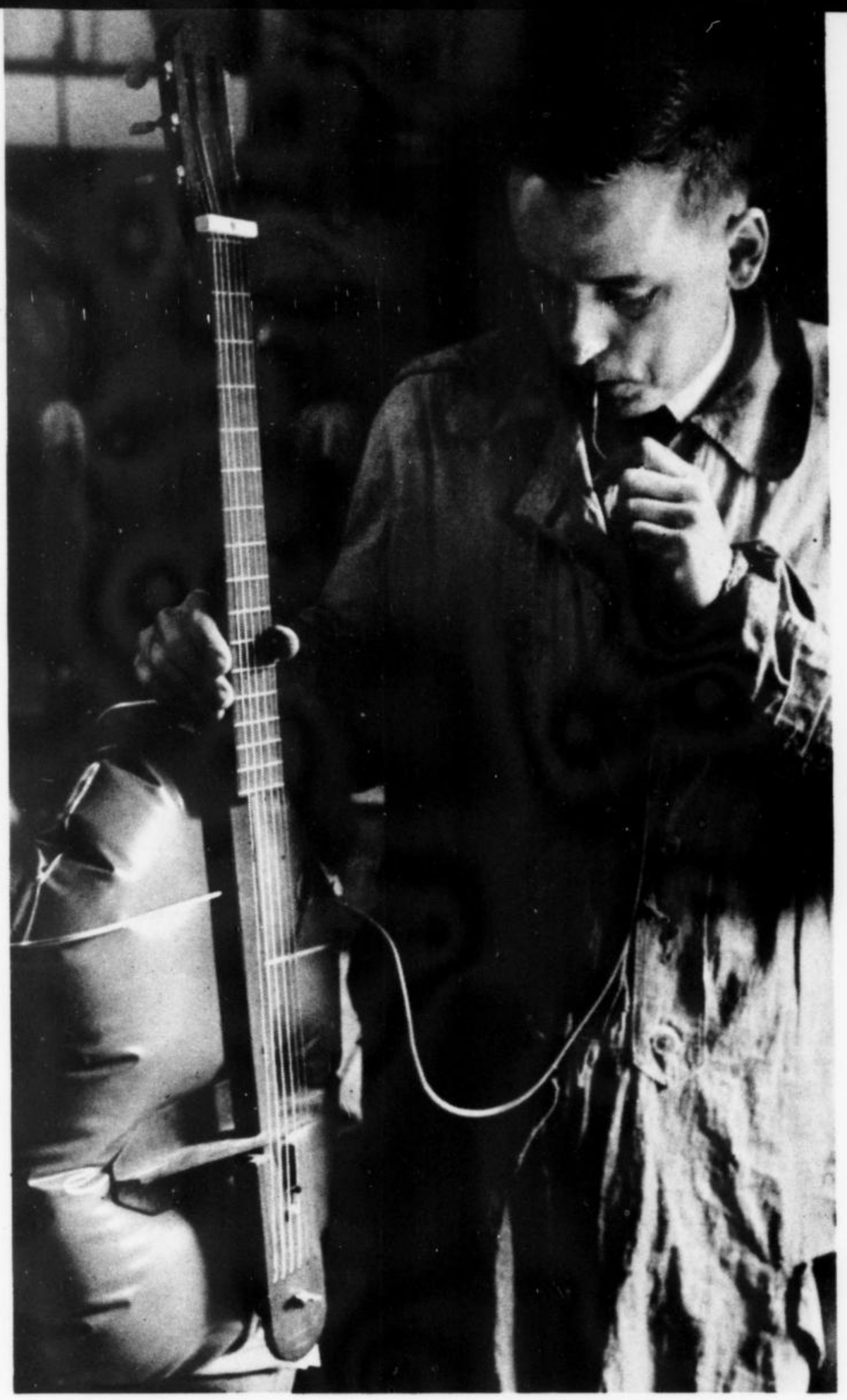
Two hands moving along a small forest of rods conjure sounds from the soprano crystal organ that are short and non-resonant.

All photos © Almasy

This strange assembly of metallic domes and "lifebuoys" (above) called "l'homme" (the man) is a new kind of percussion instrument which produces sad, drawn-out tones.

Left, the workshop where Baschet and Lasry have experimented with and built their extraordinary new instruments.

François Baschet inflates a pneumatic guitar (right). One of the simpler instruments he has devised, it has attracted many amateur musicians and soon may be mass-produced.



Future dimensions of music

repertory encourages the use of music quite freely to match the whim of the passing moment. How often do we not twiddle a knob, or change a record, because we don't feel like Rachmaninov in the morning, or because Wagner happens to overwhelm us over tea?

Taking such logic a step further, one can ensure a steady flow of suitable sound by assembling it functionally (Music for Expectant Mothers, Relaxing Tunes, Gay Melodies, the Rhythms of Productivity). Thus one eliminates the personal projections and tensions which composers reflect in successive sections of their works, to obtain a homogenized quantity varied at the behest of the listener alone. From becoming an art which carries the listener beyond himself, music is already largely converted into one which the listener manipulates, so we may expect its patrons to make the consumer's job even easier.

By the same token, composers, instead of seeking a style of their own to give as great a range as possible to what they individually wish to express, may endeavour to discover new sound-combinations (not necessarily made by instruments) to tickle the fancy of auditors in moods not yet scaled by the output of their predecessors. Already, this is the orientation of what is known as *musique concrète*.

The vision of squads of sound-engineers turning out music in response to preferences revealed by opinion polls and sample surveys is perhaps repulsive. But is it, in fact, any worse than the possessed genius trying to make headway against indifference, or the master craftsman executing a composition to special order?

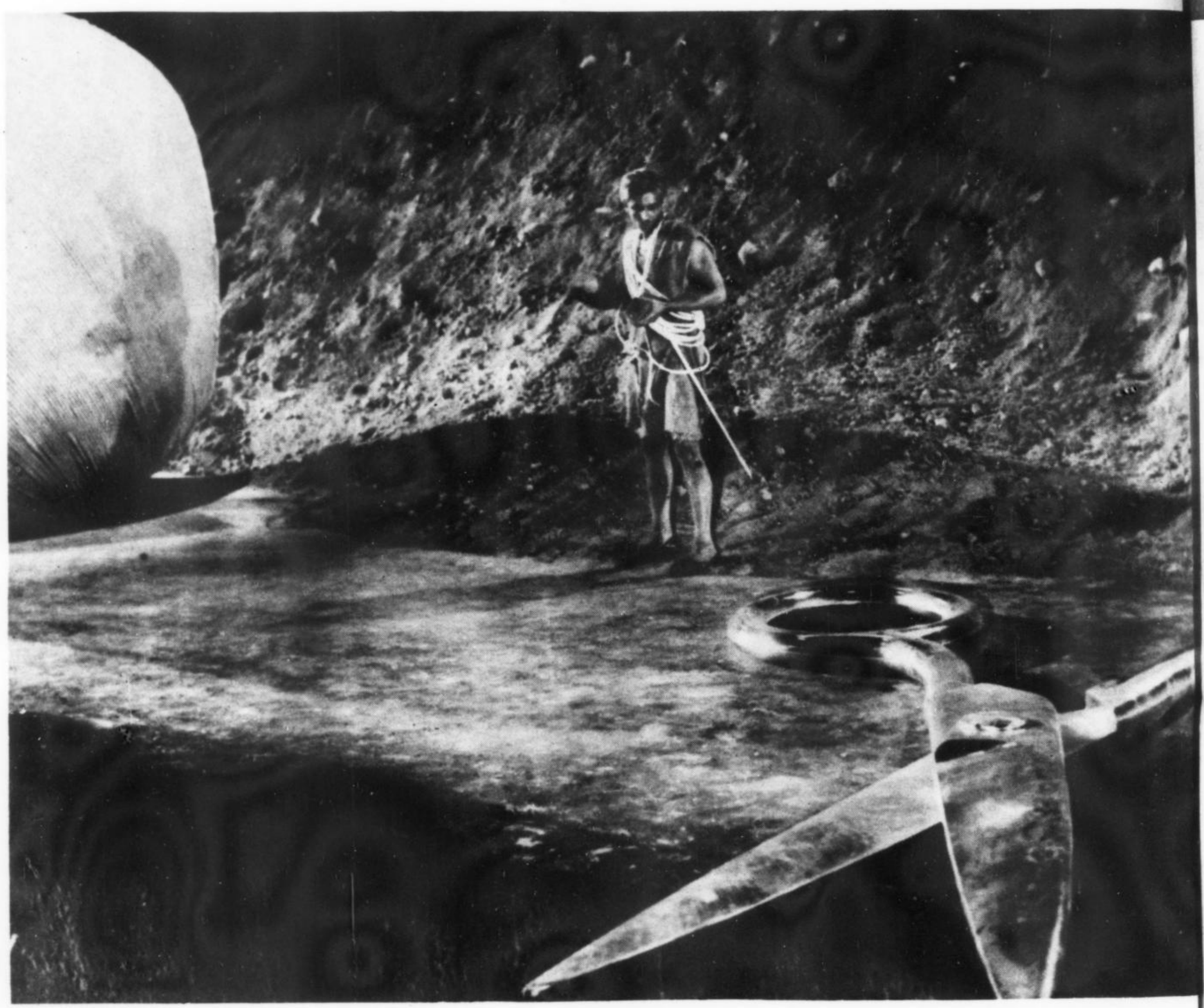
The whole history of Western music is one of conflict between the innovators and the conservatives, between those who reached out for something beyond the already achieved, and those who were automatically outraged by any infringement of the established rules of their day. Possibly, in the coming decades, this conflict will take a different shape: tension between those who stress music primarily in its personal and æsthetic dimension, and those who develop it along lines of utilitarianism and therapy. Which would be perfectly in accord with the wider tensions to which modern societies are subject.

IN DEFENCE OF SCIENCE-FICTION

by

Arthur C. Clarke

On September 27 in New Delhi, the Kalinga Prize for the Popularization of Science was awarded to the British science and science-fiction writer, Arthur C. Clarke. As tenth winner of this award, Arthur Clarke was also the first interpreter of the space age to be so honoured. The prize-giving ceremony was held to coincide with a meeting of the Indian National Commission for Unesco and thus took place for the first time in the country of Kalinga Prize founder, Mr. B. Patnaik, of the Orissa Legislative Assembly. Below we publish Arthur Clarke's address delivered in New Delhi, in which he describes his award as a tribute to his particular field of writing — science-fiction. The idea that artificial satellites might one day be used for relaying radio and television (now become reality with Telstar) was suggested by Arthur C. Clarke as early as October 1945 in an article "Extra-Terrestrial Relays", published in *Wireless World*.



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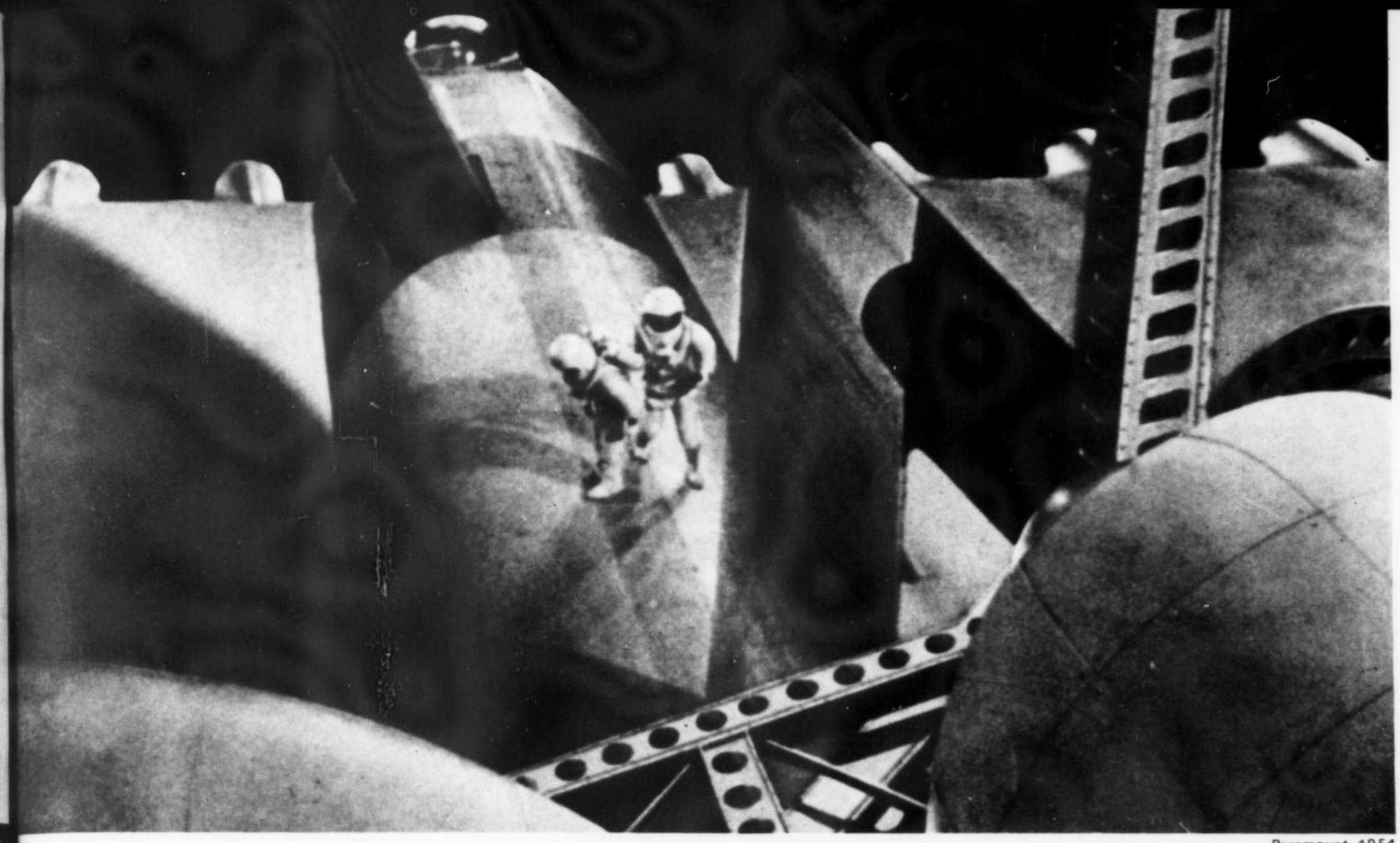

Paramount 1954

Long before rockets and artificial satellites went into orbit around the earth science-fiction writers had already reached the moon and other planets, travelled to the heart of the earth and explored time. Though such forward-looking stories have sometimes evoked their share of scientific scoffing, some have, in fact, become reality. Novels and films have helped to spread the ideas of spaceflight as in "Conquest of Space" (above) and of possible futuristic mishaps as in "The Incredible Shrinking Man" (left) who gradually diminished to the size of a microbe.

In addition to the pride I personally feel on receiving the Kalinga Prize, I would like to think that it is a tribute to the field of literature in which I have specialized—science-fiction. Although at least four of the earlier prize-winners have written some science-fiction (1), it has been only a minute and incidental portion of their output. I can claim that it is a major part of mine, for I have published just about as much fiction as non-fiction.

Many scientists, I am sorry to say, still look down on science-fiction and lose no opportunity of criticizing it. For example, they often point out that ninety percent of science-fiction is rubbish—ignoring the fact that ninety percent of *all* fiction is rubbish. Indeed, I would claim that the percentage of competent writing in the science-fiction field is probably higher than in any other. This is because much of it is a labour of love, written by enthusiasts who have considerable scientific knowledge and who are often themselves practising scientists.

What role does science-fiction actually play in the popularization of science? Though it often serves to impart information, I think its chief value is *inspirational* rather than educational. How many young people have had the wonders of the universe first opened up to them, or have been turned to a scientific career, by the novels of Verne and Wells? Many distinguished scientists have paid tribute to the influence of these great masters, and a careful survey would, I believe, reveal that science-fiction is a major factor in launching many youngsters on a scientific career.

It is obvious that science-fiction should be technically accurate, and there is no excuse for erroneous information when the true facts are available. Yet accuracy should not be too much of a fetish, for it is often the spirit rather than the letter that counts. Thus Verne's *From the Earth to the Moon* and *A Journey to the Centre of the Earth* are still enjoyable, not only because Verne was a first-rate story teller, but because he was imbued with the excitement of science and could communicate this to his readers. That many of his "facts" and most of his theories are now known to be incorrect is not a fatal flaw, for his books still arouse the sense of wonder.

It is this sense of wonder that motivates all true scientists, and all true artists. We encounter it in the writings of such scientific expositors as Fabre, Flammarion, Jeans, Rachel Carson, Loren Eisley, as well as many of my precursors at this function; and we meet it again in all scientific romances that are worthy of the name. Any man who can read the opening pages of Wells' *The War of the Worlds* or the closing ones of *The Time Machine* without a tingling of the blood is fit only for "treasons, strategems and spoils."

The cultural impact of science-fiction has never been properly recognized, and the time is long overdue for an authoritative study of its history and development. Perhaps this is a project that UNESCO could sponsor, for it is obvious that no single scholar will have the necessary qualifications for the task. In one field in particular—that of astronautics—the influence of science-fiction has been enormous. The four greatest pioneers of spaceflight—Tsiolkovsky, Oberth, Goddard and von Braun *all* wrote science-fiction to propagate their ideas (though they did not always get it published!).

In spreading the ideas of spaceflight, science-fiction has undoubtedly helped to change the world. More generally, it helps us to face the strange realities of the universe in which we live. This is well put in an article recently sent to me by a science-fiction "fan" who also happens to be a Nobel Prize winner—Dr. Hermann J. Muller, whose discovery of the genetic effects of radia-

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(1) *Ed. note: Julian Huxley ("The Tissue Culture King"); Bertrand Russell (stories from his collection, "Satan in the Suburbs"); George Gamow ("Mr. Tomkins in Wonderland" and "Mr. Tomkins Explores the Atom"); Ritchie Calder ("Forbidden City").*

SCIENCE-FICTION ON THE SCREEN

The fantastic imagination of science-fiction writers of yesterday and today is illustrated in scenes from films shown here, from left to right : "The Invisible Man" and "The Time Machine", both by H. G. Wells, "Satellite in the Sky" and "Earth vs. Flying Saucers". Transposed to the screen, in recent years this "literature of a changing world" has made an even wider impact on the man in the street.

Universal Pictures

Literature of a changing world

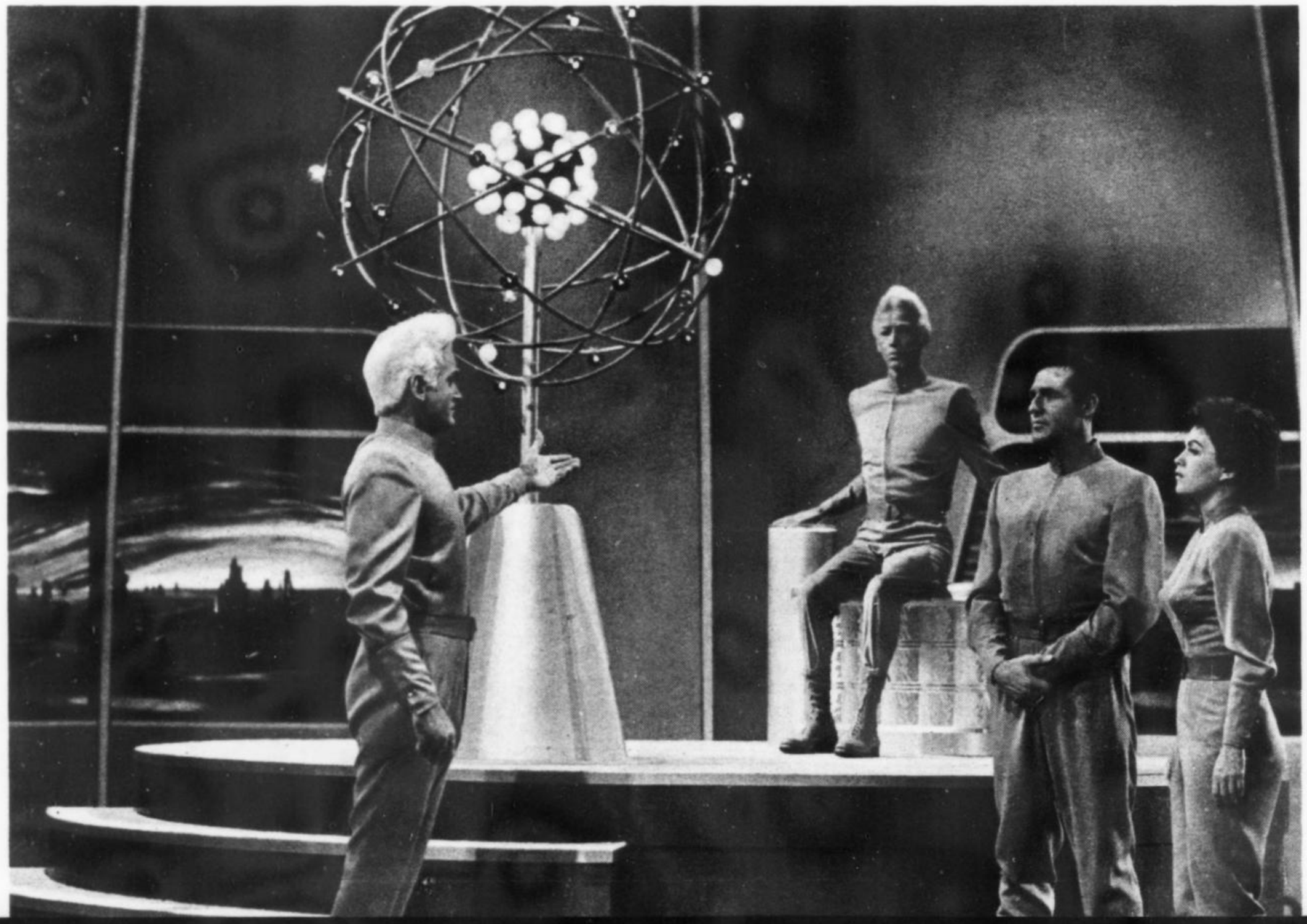
tion has inadvertently inspired much recent science-fiction and made "mutant" a modern bogey-word.

To quote Dr. Muller (Science-Fiction as an Escape: *The Humanist*, 1957, No 6.): "The real world is increasingly seen to be, not the tidy little garden of our race's childhood, but the extraordinary, extravagant universe descried by the eye of science ...If our art...does not explore the relations and contingencies implicit in the greater world into which we are forcing our way, and does not reflect the hopes and fears based on these appraisals, then that art is a dead pretence... ...But man will not live without art. In a scientific age he will therefore have science-fiction."

In the same paper, Dr. Muller points out another valuable service that this type of literature has performed. "Recent science-fiction," he writes, "must be accorded high credit for being one of the most active forces in support of equal opportuni-

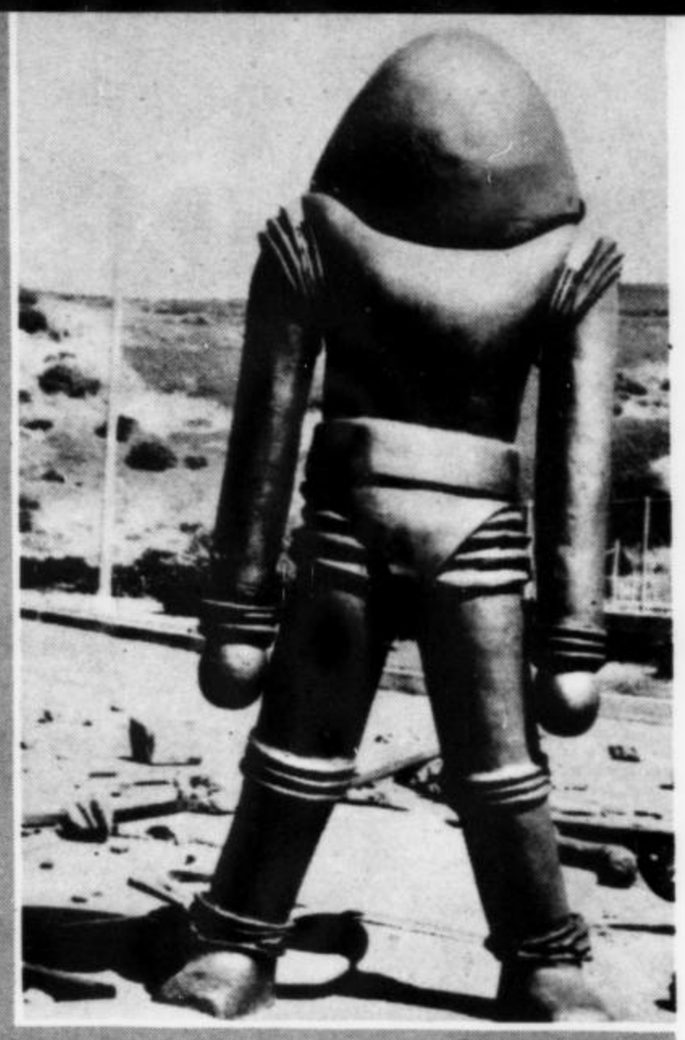
Science-fiction has encouraged the cosmic viewpoint, quickly making those who read it realize the absurdity of mankind's present tribal divisions. In the film "This Island Earth" (below) two inhabitants of a distant planet named Metaluna outside our solar system return home in their spaceship with two hostages after visiting the earth.

Universal International 1956



M.G.M.

© Warner Brothers



Columbia Pictures

ties, goodwill and co-operation among all human beings, regardless of their racial and national origins. Its writers have been practically unanimous in their adherence to the ideal of 'one free world'."

That, I think, is inevitable. Anyone who reads this form of literature quickly realizes the absurdity of mankind's present tribal divisions. Science-fiction encourages the cosmic viewpoint; perhaps this is why it is not popular among those literary pundits who have never *quite* accepted the Copernican revolution, nor grown used to the idea that Man may not be the highest form of life in the universe. The sooner such people complete their education, and re-orientate themselves to the astronomical realities, the better. And science-fiction is one of the most effective tools for this urgent job.

For it is, pre-eminently, the literature of *change*—and change is the only thing of which we can be certain today, thanks to the continuing and accelerating Scientific Revolution. What we science-fiction writers call "mainstream literature" usually paints a static picture of society, presenting, as it were, a snapshot of it, frozen at one moment in time.

Science-fiction, on the other hand, assumes that the future will be profoundly different from the past—though it does not, as is often imagined, attempt to *predict* that future in detail. Such a feat is impossible, and the occasional direct hits of Wells and other writers are the result of luck as much as judgement.

But by mapping out *possible* futures, as well as a good many impossible ones, the science-fiction writer can do a great service to the community. He encourages in his readers flexibility of mind, readiness to accept and even welcome change —in one word, *adaptability*. Perhaps no attribute is more important in this age. The dinosaurs disappeared because they could not adapt to their changing environment. We shall disappear if we cannot adapt to an environment which contains spaceships and thermonuclear weapons.

Sir Charles Snow ends his famous essay *Science and Government* by stressing the vital importance of "the gift of foresight." He points out that men often have wisdom without possessing foresight. Perhaps we science-fiction writers sometimes show foresight without wisdom; but at least we undoubtedly *do* have foresight, and it may rub off on to the community at large.

Before concluding, I would like to take this unique occasion of the first Kalinga presentation on Indian soil, to speak about the promotion of the scientific outlook in the East. Though this task is important enough in the West, it is even more desperately urgent here. Two of the greatest evils which afflict Asia, and keep millions in a state of physical, mental and spiritual poverty, are Fanaticism and Superstition. Science, in its cultural as well as its technological sense, is the great enemy of both; it can provide the only weapons that will overcome them and lead whole nations to a better life.

For Fanaticism is incompatible with the open-minded, inquiring spirit of science—with the readiness to accept the discipline of external reality, even if it conflicts with one's personal hopes and beliefs. The motto of the fanatic is "Don't confuse me with the facts—I've made up my mind." This is the exact antithesis of the Scientific Outlook.

As for Superstition—most of us can remember, though too many people have already forgotten, the events of last February 5. On that date a natural and inevitable grouping of the planets (that has happened about twenty times since the days of the Kalinga empire!) caused needless fear to millions. How many lakhs—if not crores—of rupees were then expended to ward off astral influences? And most of that money was spent by families who could ill afford it.

That was a spectacular example of the evils of superstition, but there are countless others unnoticed by the world. Recently, not far from my home in Ceylon, a villager was bitten by a snake. He could get no medical treatment, because the date was inauspicious; and so he died.

Two years ago Monsieur Jean Rostand, referred to India as "that great nation which welcomes the future without rejecting the past." That is a good policy for any nation —as long as it realizes that there are things in the past that *must* be rejected. Science, which after all is only common-sense raised to the n'th degree, can tell us what to preserve and what to reject. Heed its voice—if not for your own sakes, then for the sake of the lovely, dark-eyed children of Asia and Africa, who are born in millions every year —and die in millions the next. Their only hope of a better future lies in Science combined with Wisdom and Foresight. I shall be happy indeed if any writings of mine have helped towards this goal.

DIGGING FOR HISTORY

An account of excavation in Nubia during 1961-62

by Rex Keating

© G. Gerster, Zurich

BRILLIANTLY-COLOURED FRESCOES as fresh as the day they were executed 1,000 years ago were found several months ago on the walls of a Christian church at Faras in Sudanese Nubia. Here, Professor C. Michalowski, leader of the Polish Expedition examines one of the most remarkable of these murals. It depicts the crowned figure of the Archangel Michael protecting Shadrach, Meshach and Abednego from the flames of the fiery furnace into which they were cast by King Nebuchadnezzar. Below, another of the murals at the Faras excavation site is brought to light.

Unesco-R. Keating

A SMALL felucca traces an erratic course through the broken waters of the Second Cataract. It swings perilously close to a big rapid named Kabuka, whose roar fills the air with sound and then slips to safety under the lee of a rocky islet.

From it springs a young man, Hans Nordstrom. He is an archæologist and member of the UNESCO Mission to Sudanese Nubia which is engaged on an archæological survey of sections of the Cataract area on behalf of the Sudan Government. The islet, Shahgil, is one of many which give to the Cataract its well-merited name "The Belly of Stone".

On many of these islands are the remains of churches and settlements dating from the twilight of Christianity in Nubia; some conceal traces of the much earlier Meroitic civilization, as on Gumnarti where in 1962 the survey team led by Dr. W. Adams found and excavated a Meroitic village.

But Shahgil is a tiny island, too small for habitation, and Nordstrom had little hope of its surrendering anything more than had the score of similar islets over which he had scrambled fruitlessly during the last few

weeks. He was about to climb down from the summit to the boat when his trained eye was attracted to a crevice about five metres above the present high-water level of the Nile. A quick examination convinced him that he had stumbled on a neolithic "fishing industry" site.

Beneath a sand deposit was a layer of fish bones and potsherds some twenty centimetres deep and a thick layer of ash. The bones were large, similar to those of the big Nile perch of today. This it seems was no habitation site but a camp to which the fishermen returned seasonally to fish the big rapid nearby. The fish thus caught they smoked on the spot and removed the flesh, leaving the bones behind when they departed for their homes on the mainland.

Those fishermen casting their nets around six thousand years ago lived on the threshold of recorded history and the discovery may establish a bridge between Neolithic Sudan and pre-historic and archaic Egypt. One of Egypt's archaic kings, Djer of the First Dynasty, has left an inscription—the oldest in Nubia yet found—on the Hill of Sheikh Suleiman not a dozen miles from the Neolithic fishing camp.

This shadowy sovereign, as the inscription records, sent a military expedition to Nubia, around five thousand years ago. Thereafter the mists of time and superstition close in over Nubia for centuries and do not clear until the intrepid Princes of Elephantine, guardians of Egypt's southern frontier with Nubia in the Sixth Dynasty of the Old Kingdom Period, led their expeditions from Elephantine where now stands modern Assuan, up-river into the "Land of the Ghosts" as they fearfully termed the awesome territories to the south. This was around 2 400 B.C., and the great caravan captains of that era established trade links with inner Africa which became vital to Egypt's economy and which were to endure, with minor interruptions only, for the next two thousand years.

The tales of their exploits are graven on the walls of their tombs overlooking Elephantine Island where they can be seen to this day by any visitor who takes the trouble to climb the steep cliff to the row of sepulchres that pierce the rock-face. To these men, then, has gone the credit for opening up the road to that stretch of the Nile which today is known as Nubia, and beyond. Or so

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Blast furnaces in the 'Land of the Ghosts'

it was believed, and this belief is reflected in every published work on early Egyptian history.

Then an archæologist's wife taking her dog for its evening walk along the banks of the Nile noticed something in the sand which must lead to a revolutionary reassessment of Egypt's early relations with Nubia. What Mrs. Emery had seen was a concentration of copper slag, and it led in the winter of 1961-1962 to the discovery by Professor W.B. Emery, who leads the Egypt Exploration Society's Expedition at Buhen opposite Wadi Halfa, of a fully-fledged Egyptian industrial town.

It was a town devoted to the smelting of copper, and the excavators found mortars and stone hammers, and crucibles with pieces of pure copper that had splashed over the edges, still lying where they had fallen some forty-six centuries ago. They found the moulds and finally uncovered the blast furnaces used for smelting the copper.

Most important though, were the pieces of inscribed pottery which were unearthed and the many clay sealings of the type used to secure the bindings around papyrus documents. These sealings demonstrated that the town was in official contact with Egypt and bore the names of kings of the Fourth and Fifth Dynasties including those of the builders of the Pyramids of Gizeh, near Cairo. So that when the first stone of the Great Pyramid was laid, Egyptian vessels were loading pure copper ingots at the quays of an Egyptian town deep inside Nubia. And all this was taking place at least two centuries before the first of the great caravan captains of the Sixth Dynasty was born.

Not least among the tantalizing vistas opened by this discovery is the whereabouts of the source of the copper ore which is of very high quality. The Egyptians, an intensely practical and conservative people, always worked their copper as near as possible to its source, a source which must have been considerable since the furnaces were worked for at least a hundred years. Copper is a valuable commodity; will the mines be located and if found will they prove to be still rich in yield?

At the very end of the 1962 digging season, Professor Emery cut a trench across the whole town-site and came across buildings one below the other down to a depth of four metres. The large size of the mud-bricks in the lowest levels provided a clue to their date, which may extend back to the Archaic Period—to the First and Second Dynasties. Next season's digging at Buhen promises exciting revelations.

To add point to Professor Emery's revolutionary findings is the discovery, made also in 1962 by the Franco/Argentine Expedition led by Professor J. Vercoutter, of an Archaic Egyptian cemetery not twenty miles from Buhen containing sealings of the First Dynasty.

All in all, therefore, it now looks as though the Egyptians had a strong foothold in Nubia possibly five hundred years earlier than the historians tell us, and that they lost control of the territory so completely that by the time of the explorers of the Sixth Dynasty Nubia had receded into legend.

In the first weeks of this year, on top of a rocky hill ten miles north of Buhen I watched some twenty Nubian workmen with ropes and wooden beams heave and strain at a great rock lying buried in rubble. The rock stirred and excitement mounted until with a mighty heave it lifted out of the hole, teetered for a moment, then toppled down the side of the hill amid shouts of delight.

The hill, called Sidi Qurnein, stands some two hundred yards from the west bank of the Nile and its flanks merge into a desert which stretches across an entire continent to the Atlantic, three thousand miles away. Here there can be no life save that bequeathed by the river surging north to the distant Mediterranean.

This is the spot where in the sixteenth century B.C., a prince, Prince Amenemhet, of what is now called Debeira, chose to excavate his tomb, and here, three thousand five hundred years later a group of archæologists from Scandinavia re-opened it. When the great stone fell it revealed the top of a shaft cut vertically in the rock to a depth of twenty-two feet and at the bottom was a passage leading off into darkness. This is the moment which provides the field archæologist with his greatest thrill; will the tomb be intact or will the ancient robbers have got in first?

The passage was forty feet long and its floor was covered with pottery vases, among them a plaque inscribed with the figure of the goddess Nut and several canopic jars bearing the name of Amenemhet's brother, Djehuty-hotep, Prince of Teh-khet, whose tomb is across the river on the opposite bank. The burial chamber was empty but several small objects left behind by the robbers hinted at the richness of the original burial.

The really valuable find was in the tomb chapel a little further down the hill where Professor Säve-Söderbergh, who leads the Scandinavian Joint Expedition, found leaning against the wall of the shrine, the finest stela yet discovered in Nubia. On the grey granite are the names and titles of Prince Amenemhet and the beautifully incised hieroglyphs are filled with yellow paint as fresh in colour as the day it was mixed.

Prince Amenemhet and Djehuty-hotep were Nubians who had become so Egyptianized that there was nothing in their names, titles and form of burial to distinguish them from true Egyptian grandees of the Eighteenth Dynasty, living around 1500 B.C. The brothers illustrate the final stage in the long process of Egyptian domination of Nubia, a process which had begun about a thousand years earlier, in the period when the Princes of Elephantine of the Sixth Dynasty were leading their expeditions south into the Land of the Ghosts.

This was the time when a mysterious people, known to archæologists as the "C-group" to distinguish them from their predecessors the "A" and "B-group" peoples, appeared in Nubia, possibly from the south or west. They were a people well-organized and skilled in the art of war and were almost certainly the enemy against whom the Egyptian kings of the Twelfth Dynasty built

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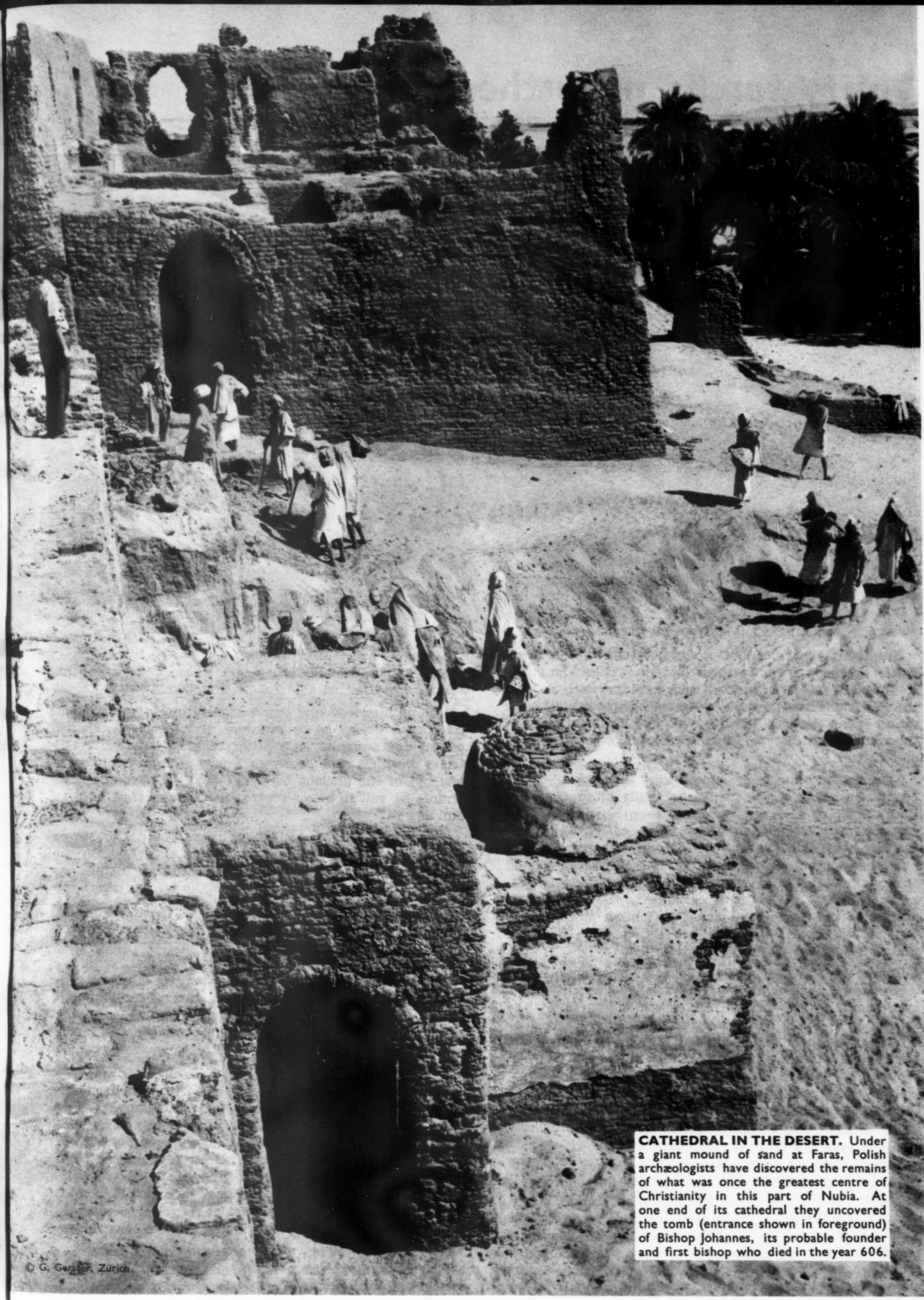


CATHEDRAL IN THE DESERT. Under a giant mound of sand at Faras, Polish archæologists have discovered the remains of what was once the greatest centre of Christianity in this part of Nubia. At one end of its cathedral they uncovered the tomb (entrance shown in foreground) of Bishop Johannes, its probable founder and first bishop who died in the year 606.

© G. Gerster, Zurich

Thirty tombs unearthed per day

around 2000 B.C. the line of protective fortresses along the length of the Second Cataract, fortresses which even today can excite wonder by their sheer strength and ingenuity of design.

Yet within five hundred years of their arrival in the area this formidable people apparently vanished from Nubia without trace. Intensive excavation of their cemeteries, however, during the 1962 season has solved the riddle of their fate. The area of Debeira, where the Danes, Finns, Norwegians and Swedes of the Scandinavian expedition were at work is particularly rich in C-group remains.

Working against time—for all these cemeteries are doomed to be swallowed by the flood waters of the High Dam—and using the latest tools of field archæology, the Scandinavians were clearing and recording up to thirty graves a day. The clearance of several C-group cemeteries was also undertaken by the Spanish Expedition under the direction of Prof. Blanco y Caro.

THE thousands of objects recovered and the design of the tombs themselves have revealed how over the centuries the C-group culture was peacefully, yet inexorably, absorbed by that of the Pharaohs, so that by 1500 B.C. the native princes of Debeira have become culturally indistinguishable from Egyptians.

Unfortunately the early C-group people, who were great cattle breeders, seem to have had no written language so that all that is known of their customs derives from their curious circular graves. Buried outside several such graves, near Faras, which lies just on the Sudan side of the frontier with Egypt, Hans Nordstrom found a number of ox skulls.

This was a common practice among the early C-group people, but what made the Faras skulls interesting was that the tip of each left horn had been bent downwards and forwards artificially. This custom of bending down the left horn of cattle is known from tomb paintings to have been practised during the Old Kingdom Period around 2500 B.C. and much later during the Meroitic around 600 B.C. What is remarkable is that the Nilotic peoples of the Southern Sudan—the Dinkas and Shilluks —follow the custom to this day; it is, they say, a tradition that came to them a very long time ago.

Houses of the C-group people are extremely rare so there was excitement when in 1962 three C-group dwellings were found by the Scandinavians and a fourth by the expedition of the Oriental Institute of Chicago. So, painstakingly, the field archæologists working in Nubia are piecing together the history of this enigmatic C-group people. They have discovered what became of them, how their culture was completely absorbed by that of their great northern neighbour, but have yet to solve the riddle of the origins of the C-group.

Buhen was the military headquarters of the Second Cataract area and nerve-centre of the dozen or so fortresses built around 2000 B.C. to keep the C-group people in check. Five hundred years or so later Queen Hatshepsut and the Pharaoh Thutmose III built a stone temple inside the citadel of the old fortress. Today it is the finest temple in Sudanese Nubia and is one of the monuments scheduled for removal to safety before the flood waters close over it. Professor Emery, working on behalf of the

Unesco-Keating

Egypt Exploration Society, hopes to start work on this rescue operation at the end of this year.

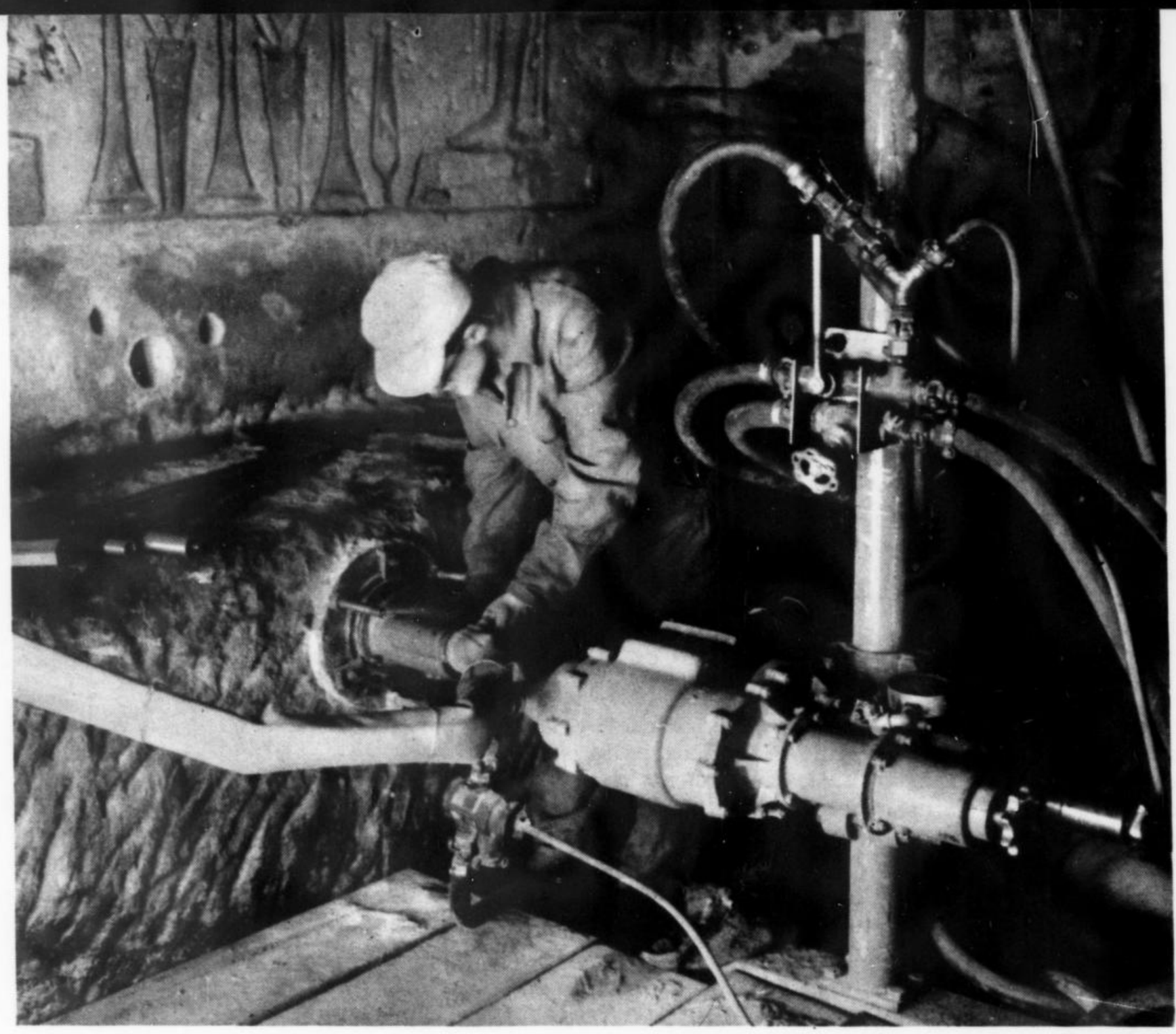
Moving inscribed and painted walls and columns which have been weakened by exposure to thirty-five centuries of burning sunshine and bitter nights, is an extremely tricky business and Professor Emery proposes to take a leaf out of the ancient builders' book. To dismantle the temple he will in effect reverse the process they used in building it.

The temple will be filled with sand and the stones manhandled by local Nubian workmen straight onto the cushioning surface without the necessity of lifting. As each course of stone is removed so the level of sand will be correspondingly reduced until the temple pavement is reached. This method will obviate the use of machinery which, apart from being difficult and expensive to get to Nubia, could damage the extremely friable sandstone.

The area beneath the existing temple is practically the only part of the fortress which has not been systematically cleared, and immediately the temple has been removed Professor Emery will start digging down to the original foundations of the citadel. He may uncover a second temple—or find nothing of interest!

Another temple threatened by the forthcoming flooding is Kalabsha, largest in Nubia after Abu Simbel. It is a Græco-Roman edifice thirty-five miles south of Assuan. Unlike Abu Simbel which can only be protected in situ, Kalabsha will, despite its great size, be dismantled stone by stone and responsibility for this most delicate operation has been assumed by the Federal Republic of Germany. Festooned in scaffolding, the temple today is being systematically taken apart for reconstruction elsewhere in Egypt.

Five miles upstream from Buhen and on the island of Meinarti is a large mound believed to conceal another



DIAMOND DRILL IN TEMPLE. In the Great Temple of Abu Simbel tests have been made to check strains in the rock during preparatory studies of the plan to encase the entire temple in a concrete block and raise it 200 feet up the side of the mountain from which it is hewn, thus saving it from the invading waters of the new Aswan Dam. Right, diamond-tipped drill operated by a Swedish engineer cuts holes in the temple walls. The drillings will be used to house instruments for measuring the internal pressures in the rock. Left, high over Sudanese Nubia an automatic camera is used for a large scale aerial archæological survey. With this all-seeing eye, scores of hitherto unsuspected archæological sites have recently been discovered.

Unesco-Keating

of the Twelfth Dynasty fortresses. The mound was, by the way, used as a gun platform during the River War against the Dervishes towards the end of the nineteenth century. Meinarti will be excavated by the Egypt Exploration Society when their work at Buhen is completed.

ANOTHER of the fortresses, Mirgissa, some ten miles south of Meinarti, is to be excavated next year, by the Franco/Argentine Expedition. Already the foundations of an Egyptian town of the period have been located on the banks of the river below and when this is dug it may well reveal valuable indications of how the inhabitants of a Nubian garrison town lived some four thousand years ago.

At Serra, a mile or so inside the Sudan border with Egypt, is yet another fort and in 1962 it was cleared down to the foundations, and the layout of the fortifications was thoroughly examined and recorded, by the Expedition of the University of Chicago's Oriental Institute, directed by Dr. Keith B. Seele.

Inside the fortifications awaiting excavation next season are several interesting buildings of early Christian date. They are contemporary with the large Christian town across the river on the west bank. Here the University of Ghana Expedition under Professor P. L. Shinnie has uncovered an astonishing complex of buildings. What started as a mudbrick church around the seventh century of the Christian era grew over the next eight hundred years into a large town with layer upon layer of buildings so numerous that, according to Professor Shinnie, it would need at least ten seasons to clear it.

Nothing could illustrate more vividly than this town the intensive occupation of Nubia during Christian times, from its conversion under the Emperor Justinian in the sixth century to its final eclipse by Islam in the fourteenth century. Indeed only a few miles down-stream from Shinnie's "dig" is Faras, ancient capital of Nobatia, the northernmost of the three early Christian kingdoms of Nubia and the Sudan.

Here under mountains of sand lie dozens of ancient sites covering an area of some five square miles, and here during 1961-1962 the Polish Expedition led by Professor C. Michalowski has been making spectacular discoveries. The huge mound on the river's edge at Faras, on which the expedition's members have been concentrating, has now been revealed as nothing less than a great church and associated buildings, containing brilliantly coloured frescoes as magnificent as they are wonderfully preserved.

The tombs of at least eight of the Bishops of Faras (its ancient name was Pachoras) have been found, the earliest being that of Johannes who died at the age of 82 in the year 606 and who was probably the first bishop of Faras.

Beneath the church are the stones of a temple built by the Pharaoh Thutmose III two thousand years earlier and below that, possibly, another Middle Kingdom fortress. Nearby is a fortress of the Meroitic period, not yet dug. Truly, Faras is a field archæologists' paradise!

When Christianity came to Nubia there was living there another of those alphabetically identified cultures, in this case the "X-group" people. Like the C-group, their origins are unknown and they have left no written language. The unrobbed tombs of their kings were discovered at Ballana and Qustul some fifteen miles north of Faras on the Egyptian side of the border.

That was in 1931 and W. B. Emery assisted by L. P. Kirwan cleared scores of tombs which yielded a fantastic quantity and variety of valuable objects. In 1961 Emery did it again, finding two large unrobbed tomb magazines

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Footprints 15 centuries old

in an X-group cemetery at Kasr Ibrim, north of Abu Simbel.

X-group cemeteries are common in Nubia and several were dug by most expeditions in the 1962 season, but the huge tumulus-graves were usually found plundered. A number of bodies came to light, however, in many cases rather too well preserved by the bone-dry sand of Nubia to be comfortably handled.

In one of these cemeteries the UNESCO mission found in a trench alongside one of the tumuli thirty-six neatly stacked baskets abandoned or forgotten by the labourers who made the mound some fifteen hundred years ago. They were perfectly preserved and look very much like the baskets one can buy nowadays in Wadi Halfa market. In a grave nearby were several pieces of bread.

This X-group cemetery is on a plain consisting of a deep deposit of greyish sand intermixed with shells, clearly the alluvial deposit of an ancient river. The deposit slopes upwards towards the surface and while digging another of the graves, Nordstrom found below the top stratum of sand a number of footprints of adults, children and camels, following what appeared to be a path in the direction of the river which nowadays is at least a kilometre away.

The footprints were about a metre below the surface and Nordstrom followed them down for about six metres to where they disappeared under the next lower alluvial deposit. The footprints being beneath the graves show that the people and animals who made them lived at the very beginning of the X-group period or immediately before it.

The footprints were no more than half a dozen miles from the Neolithic "fishing industry" described at the beginning of this article, yet in time they are separated by fifty centuries and more. This seems a tremendous weight of years and, in truth, it very nearly spans the whole of man's recorded history. But to the pre-historians and geologists of the Columbia University Expedition led by Dr. Ralph Solecki and Dr. Rhodes W. Fairbridge, a figure such as this is insignificant.

Surveying the east bank of the river from the Second Cataract down to the frontier in 1962, they found numberless artifacts, "workshops" and habitation sites indicating that in Palæolithic times this reach of the Nile was heavily populated. All these remains—among them were two fossilized skeletons, probably of homo-sapiens—came from the tops of eroded hills that stand in the desert a mile or so back from the Nile.

THESE hills are really terraces and are all that remain of the ancient plateau down through which the Nile has cut its way for around one hundred and fifty feet. Fossil soil and mineralized roots of plants led the geologists in the expedition to the conclusion that the present bed of the Nile is no more than 25,000 or 30,000 years old, and that the surrounding desert is an even more recent feature of the landscape.

The pre-historians visited Abu Simbel, which lies twenty miles or so down-river from the Egyptian/Sudan frontier, and on the hills above the temple they found many Stone-Age artifacts.

There is reason to believe that the mountain of Abu Simbel was regarded as a holy-place long before the masons and sculptors of Rameses II fashioned the rock-face into two of the most splendid temples to come down to us from the past. In 1962 I made a pilgrimage to this shrine of Rameses, my second in two years. But how changed was the scene when I stepped onto the beach in the first light of dawn !

A pneumatic drill flung back echoes from the cliff face and to its din was soon added the roar of diesel engines. Nor was this all. The narrow strip of beach was packed with men, women and children laden with cameras, and drawn up at the water's edge were the three large tourist steamers that had brought them to see the temples.

© R. Keating

GRAVEYARD FIND by Scandinavian archæologists near Debeira (left) is one of many which help specialists to reconstruct the life and customs of Nubian peoples who left no written history. In this grave were the bodies of a woman and a child. Specialist here is removing a gold mask from the woman's skull. Below, a cache of baskets discovered in a cemetery on the shores of the Second Cataract of the Nile by a Unesco Mission. Left by workmen who built the tomb 1,500 years ago, baskets look much like those that can still be bought in nearby market at Wadi Halfa.

Nordstrom-Unesco

© R. Keating

PRINCE'S TOMB. At Debeira West (above) Sudanese workmen, watched by Professor T. Säve Söderbergh, leader of a joint Scandinavian expedition, heave and strain at a great rock blocking the burial shaft leading to the tomb of Prince Amenemhet, a 16th century B.C. Nubian ruler.

Nearby, barges and lighters were unloading timber, scaffolding and masses of other equipment. Rows of tents lined the bottom of the cliff and among them technicians and workmen were already astir. Truly Abu Simbel had undergone a metamorphosis in the two years since the Nubian Campaign started.

I went into the Great Temple and there in one of the innermost chambers was an even more startling intrusion from the twentieth century. At one end of the narrow rock-cut chamber an ultra-modern piece of machinery was filling the place with sound, so that one could imagine that the very figures of the gods staring down from all sides were trembling with the vibrations of the diamond-tipped drill. Bending over it, in the glare of a spotlight, was a young Swedish engineer, seemingly oblivious of the wild incongruity of the spectacle.

The machine was cutting smooth cylinders of sandstone from walls, ceiling and floor to make way for sensitive instruments. With these a group of mining engineers from Sweden were to measure the vital forces which exerting pressures within the mass of rock hold the temple in balance and which, if disturbed haphazardly, could bring about its collapse.

The lifting of such great masses of rock, the larger—that containing the temple of Rameses—weighing around a quarter of a million tons, to a height of two hundred feet and more, represents a feat of engineering that is breath-taking. Yet for two years now, men representing a score of disciplines and as many countries have converged on the temples and have probed and surveyed, analysed and calculated.

The science and technology that can put a man into orbit and fling rockets at the moon is more than equipped to preserve even so fragile a monument as Abu Simbel. The world's technical resources stand ready, only the funds are needed to launch the most spectacular rescue operation of our time.

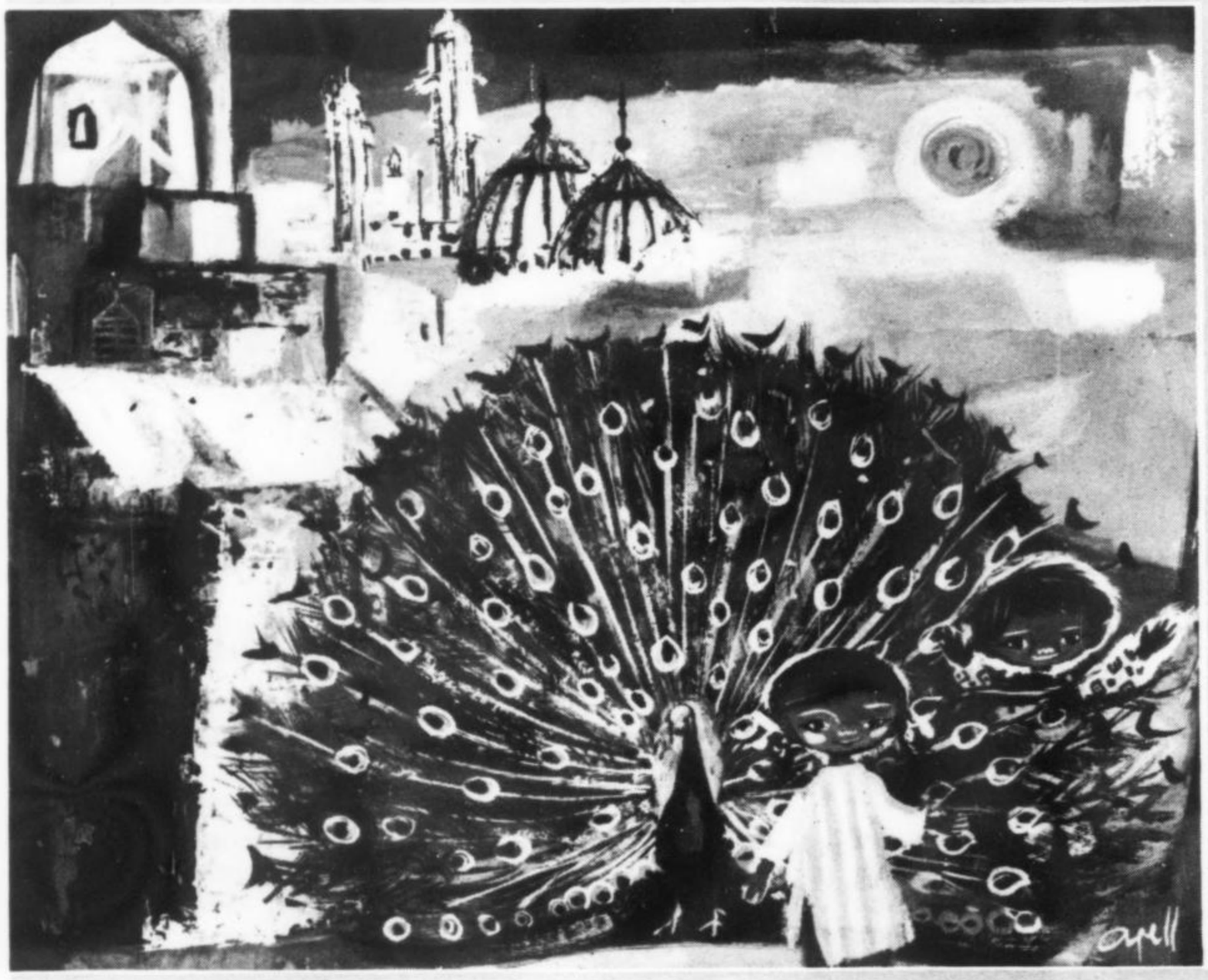
REX KEATING *of* UNESCO*'s Radio Section has devoted many years to the study of the history and archæology of ancient Egypt. He has travelled widely in the Sudan and in Egypt and other countries of the Middle East where he lived for many years. Mr. Keating has led several* UNESCO *radio missions into the areas of Nubia to be flooded by the Nile and again visited Nubia earlier this year to gather material for the above article. His profusely illustrated book, "Twilight of the Gods" on the same subject is to be published this month in the United Kingdom by Rupert Hart-Davis Ltd.* (42/-) *and in the U.S. by Harcourt, Brace and World, Inc.* (*About* $ 7.50).

Macaws and Toucan...
with South American children

Pigeons... and
children of Venice

FESTIVAL OF BIRDS

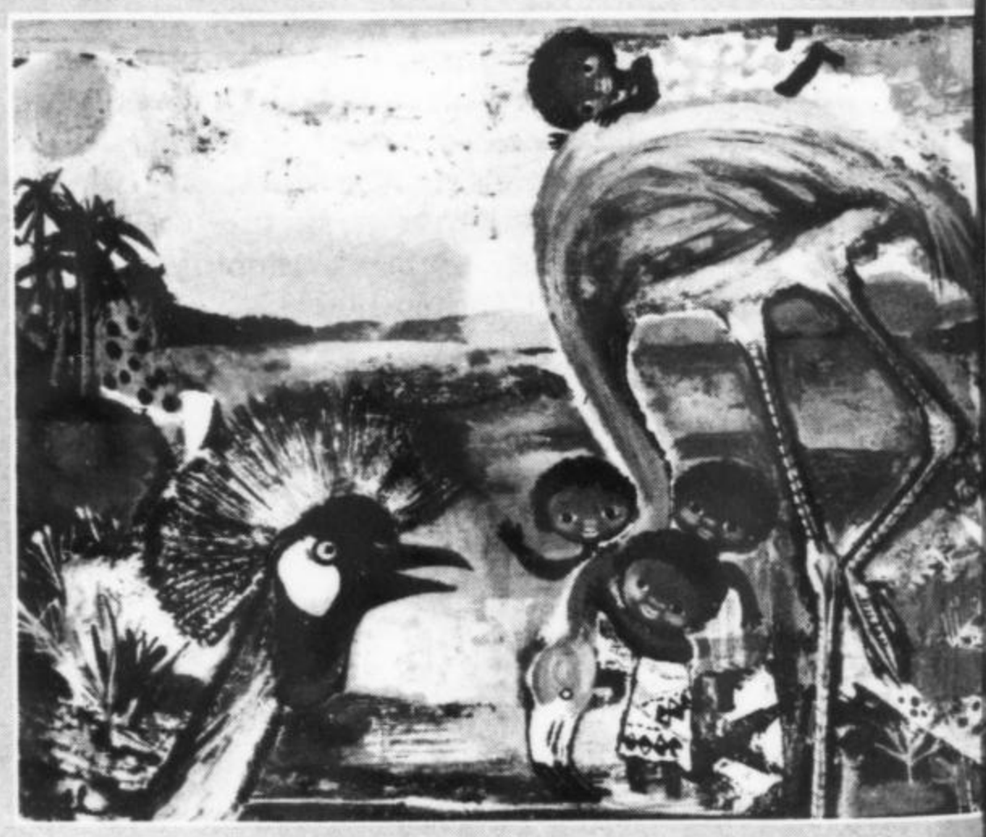
In a series of five paintings about two of the most fascinating inhabitants of our planet—children and birds—Roser Agell, a young Spanish woman has created UNICEF greeting card designs that are gay and brilliantly colourful. Each design in "The Festival of Birds" captures perfectly the delight taken by youngsters in winning the trust of their feathered friends.

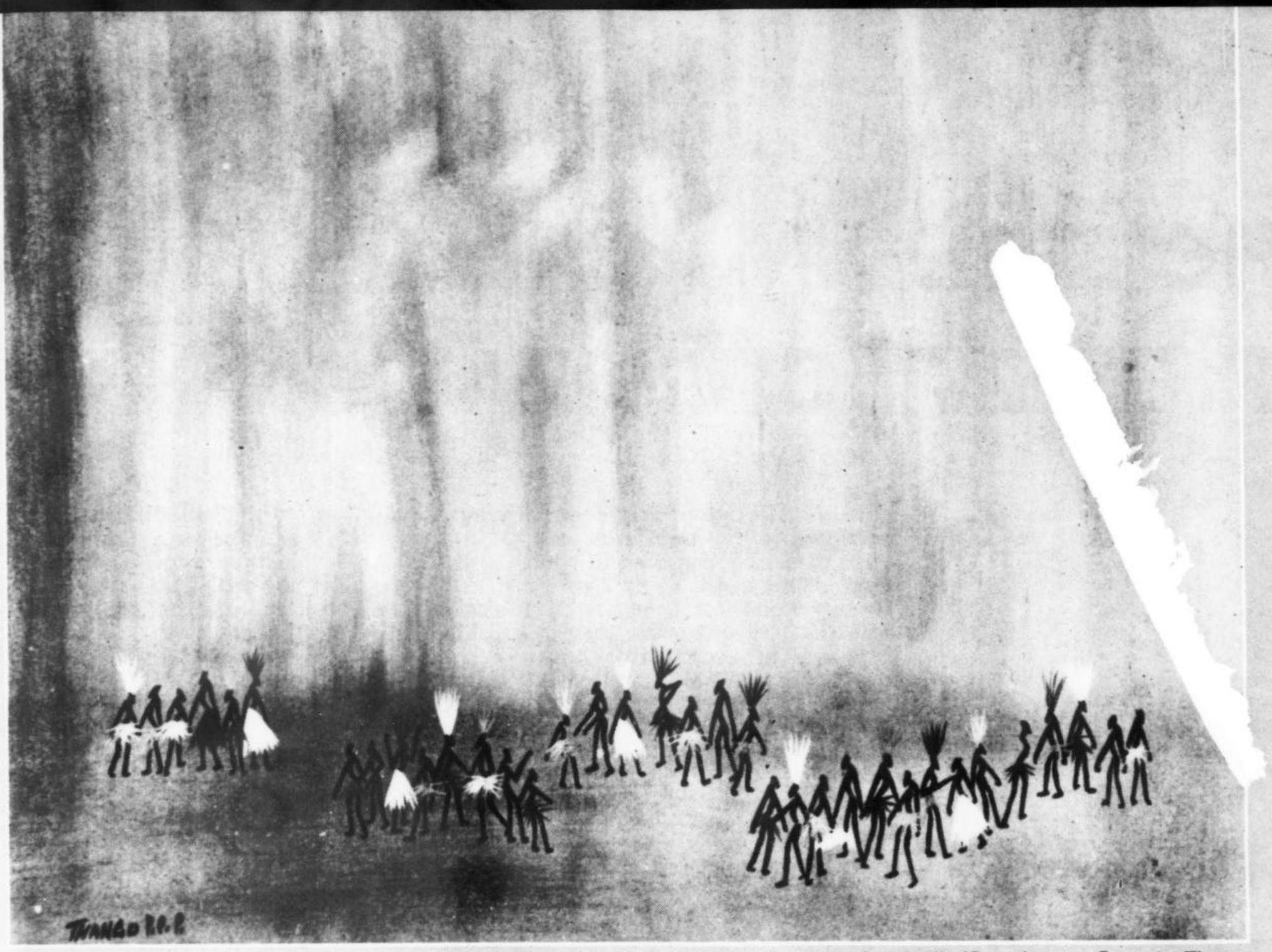


Peacock... and
Indian children

Cardinal and Chickadees...
with North American children

Flamingo and Crowned Crane...
with African children





CEREMONIAL DANCE by the young Brazzaville (Congo) artist, François Thango

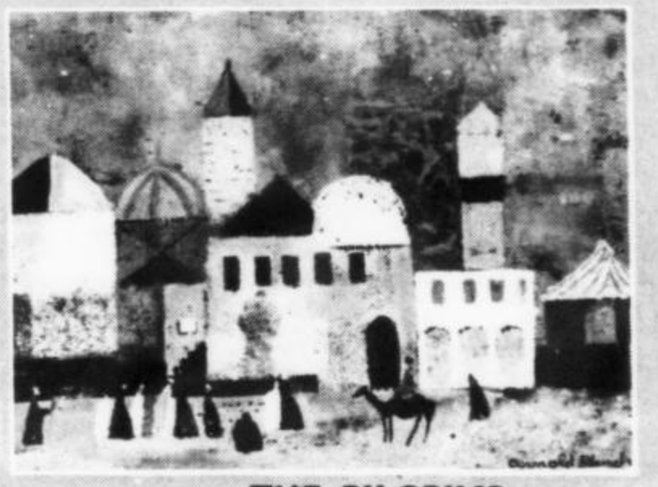
GREETING CARDS

Through its programmes to help governments meet the urgent needs of their children for medical care and adequate food, UNICEF (United Nations Children's Fund) is currently reaching 60 million children and their mothers. The opportunity to have a personal share in these programmes is given by UNICEF greeting cards which have raised nearly $5 million since they were put on sale in 1950. In 1961-62, 21.5 million cards were sold in over 100 countries. This year it is hoped to increase this figure to 25 million. The 1962/63 cards comprise 12 designs (some of which are reproduced here) by seven artists. Representative of a new group of African painters, known as the Poto-Poto (a district in the city of Brazzaville, Congo) school are Raphael Mounkala (Blessing of the Hunt) and François Thango (Ceremonial Dance). A teen-age artist, Garya Mahmoud, of Egypt, has contributed "Joy of Living", a detail from one of her weavings. U.S. artist Arnold Blanch has contributed two designs, "The Herald" and "The Pilgrims" and another U.S. painter, octogenarian Leo Schutzman has donated "Winter Carnival". Swiss artist, Max Hunziker is represented by "Compassion", symbolizing the United Nations. Finally, Roser Agell of Spain, well-known for her murals, frescoes and paintings, has designed a series of five under the title "The Festival of Birds" (see opposite page). UNICEF cards

come in boxes of ten--at $1.25 (U.S.A); 7/6 (U.K.) and 5 NF (France) per box — each box sold can provide enough DDT to protect five children from malaria for a year or one child with a daily glass of milk for eight months.

★

For further information, orders, etc., write UNICEF Greeting Card Fund, 13 Heddon Street, London W.1; United Nations Association in Canada, Committee for UNICEF, 280 Bloor Street West, Toronto 5, Ontario (Att. Mrs. G. Richards); U.S. Committee for UNICEF, POB 22, Church Street Station, New York 8, N.Y. (Att. Miss Olga Gechas) or UNICEF, Service des Cartes de Vœux, 24, rue Borghèse, Neuilly-sur-Seine, France.



THE PILGRIMS
by Arnold Blanch (U.S.A.)

WINTER CARNIVAL by
U.S. artist Leon Schutzman

JOY OF LIVING by 16 year old
Garya Mahmoud (Egypt)

The anatomy of underdevelopment (part 3)

THE RISE AND FALL OF GREAT CIVILIZATIONS

The Western world has not always a full understanding of the past achievements in science and technology of other peoples who, however, did not experience the scientific and industrial revolution that has given birth to the modern technological world. Some of the former accomplishments of these peoples along with the problems raised by traditional attitudes in the transition from a rural culture to a machine-conscious urbanized society are discussed in this, the third article in a series which began publication in our July-August issue. They are taken from a new study produced by the United Nations and shortly to be published under the title "Aspects of Underdevelopment: The Background to Freedom from Hunger."

THE question has often been asked why certain areas of the globe saw the rise of "modern" scientific and technological knowledge and others did not.

It is a commonplace that the fundamental discoveries which made civilization possible—fire-making, tool-making, agriculture, building, calculating, writing, money—were all apparently made outside the area which has given us the marvels of modern science. Nor were the mathematical and scientific concepts upon which modern industrial society rests, themselves of Western origin, as is so often believed.

Before the Christian era, peoples such as the Egyptians, the Babylonians, the Chinese, the Hindus and the Greeks all made important contributions to human thought and to practical engineering. It is likely that today's world has inherited only a fraction of the vast store of knowledge accumulated by earlier peoples. Much may have been lost, like the marvellous art of the gem carvers which disappeared with the Roman Empire, after more than 2,000 years of achievement, or like the stained glass techniques of Chartres and the Sainte Chapelle, which are the despair of modern craftsmen. If this is the case, we shall never know how often we tread in the footsteps of some daring, but forgotten, thinker whose papyri parchments or clay tablets have returned to dust.

However that may be, the modern Western world has not always a full understanding even of those achievements of other peoples about which no doubt exists.

Few save professional archæologists realize the scale on which the peoples of the Ancient East carried out such engineering projects as irrigation schemes. In the Twelfth Dynasty of Egypt, the Pharaoh Amenemhet III brought much of the Nile Valley under cultivation, causing its waters, when they reached a dangerous flood level, to be diverted into the escape reservoir of a depression in the Fayyum which his engineers converted into an artificial lake of great dimensions. At about the same time, the Babylonians brought the river Euphrates under control and caused its waters to flow into artificial ponds covering 650 square miles, in which the water stood twenty-five feet deep during the flood season.

For scores of generations, the Chinese worked their miracles with jade, bronze, ivory and silk in almost complete isolation from the cultures of Europe. Meanwhile, they were inventing the mariner's compass, gunpowder and printing and making other discoveries far in advance of the rest of the world, while the Great Wall which they were building still remains, in the second half of the twentieth century, the largest work erected by man on this planet.

Very early in recorded history, India's craftsmen developed a variety of marvellous skills. Ancient Rome was a market for Indian fabrics so delicate that it was said they were invisible when moistened and laid on the ground. Across the Atlantic, the Aztecs of Central America evolved a calendar which has been called more accurate than our own. The precursors of the Incas in the high Andes built walls of huge dressed stones, so skillfully laid without cement that, after nearly twenty centuries, it is impossible to insert a knifeblade between them. Later the Incas themselves constructed a road system along the high Andes, many hundreds of miles in length, which is still one of the engineering marvels of the world.

NOT one of these astonishing cultures produced what we understand as an industrial revolution. From the time of the Greeks, some of the finest products of China and India found their way to Western markets but, unlike our machine civilization, the cultures which found such perfect expression in them exercised little influence on other peoples.

The Arabs, during a relatively brief but brilliant flowering, bequeathed to Europe much of the inherited science of Ancient Greece and made fundamental contributions of their own in the fields of chemistry (an Arabic word) and mathematics. The figures now used in calculation by Western scientists, financiers and village schoolchildren were brought to Europe from India by Arab mathematicians, and displaced the clumsier Roman numerals.

No one can say with confidence why the impulse of Arab science and learning withered, for we are here dealing with the little understood problems of the rise and fall of civilizations. What is certain is that the spirit of inquiry and experiment first fostered by the Ionian Greeks later passed, by way of the Arabs, to various European peoples, and that the birth of the "modern" technological world was entirely a European phenomenon.

It looks as if the world is now entering upon a phase in which non-Western peoples are about to be drawn once more into the field of scientific and engineering progress.

© Almasy

ENGINEERS FOR INDIA. India boasts one of the most modern institutes of technology in Asia with the recent completion of the Indian Institute of Technology in Bombay shown here. Established with the help of U. N. Technical Assistance funds, the institute can accommodate up to 2,000 students. Nine hundred students and 150 trainees are already taking courses. Unesco has spent since 1955 nearly $1 million on specialists, $3 million to provide scientific equipment and $200,000 for scholarships. Nineteen Unesco specialists are working on the staff. The institute will be officially inaugurated later this year.

With the great stress now being laid upon the training of research workers and engineers and the vast increase in the pool of human talent which the spread of education will open up outside the Western world, it is tempting to speculate on the immense advances which the next hundred years may witness.

As the impulse of the Moslem thinkers waned, a deep stirring began in eleventh and twelfth-century Europe. New ideas, new ways of thought and possibilities of living continued to present themselves, until the life of the Western European peoples was affected in all spheres, from the conditions on which a tenant farmer held his acres to the technique of portrait painting.

Then, in the fifteenth-century—and still more in the sixteenth—came the great explosion. Henry the Navigator began the patronage of seafarers which was to lead to Columbus, Vasco de Gama, Magellan and the new maps of an unsuspected world. Giotto had shown the way, but now came Leonardo da Vinci and Michelangelo. The rare personal touches which a mediæval memoir writer allowed himself blossom into the ironic self-exploration of a Montaigne. Cervantes writes the first great novel of Europe, though not of the world, and Shakespeare gathers up in himself the resources of an age, and of every age. Bacon and Descartes lay the foundation of modern thought. Rembrandt for the first time puts all experience into the lights and shadows of an aging face.

Nothing quite like this was happening in the other cultures of the world. Europe's intellectual and spiritual experiments at this time were associated with changes in Western man's relation to his fellow citizens, in which economic elements played an important part. Especially in England, society was moving from a static condition centred on the country gentleman into a dynamic phase in which the merchant was working—and working with grim persistence—toward supremacy. The great explorers of the fifteenth and sixteenth centuries were advance guards of commerce. Columbus won support, and sailed, because he believed that he could open a more profitable route for trade with India.

One immediate result of the discovery of the New World was a flow of gold and silver into the treasuries of Europe. Economic historians have shown how this new supply of the precious metals released fresh energies in many departments of European life. It did more than help to finance new merchant ventures and to pay for more goods offered for sale. It led to the endowment of numerous public institutions such as schools, which opened the doors of learning and opportunity to many, and so helped to cultivate the resources of Europe's most gifted minds. Shakespeare's grammar school at Stratford-on-Avon was endowed in this way about a century before his time.

There is reason to think that a good many inventors in

CONT'D ON NEXT PAGE

UNDERDEVELOPMENT *(Cont'd)*

Revolutions in farming & industry

mediæval Europe may have worked secretly and kept their discoveries to themselves, for fear of persecution as wizards. With the dawn of the "modern world" new discoveries of all kinds became fashionable and rewards were attached to those that had money-making possibilities.

By the eighteenth century, even provincial clergymen in England were inventing new appliances for the spinning and weaving which were so prominent in the early stages of the industrial revolution. Such inventions held the promise of bigger profits for mill owners and merchants, and this was the best way to secure a hearing in a world where manufacturers and investors of capital were coming rapidly to the fore.

In seeking an explanation for the rapid growth of the factory system in England around 1800, we shall find no more important cause than the rise, over the previous five centuries, of an enterprising and increasingly prosperous commercial class. These new merchants or businessmen began to emerge with the shift from subsistence agriculture to an economy of exchange. They formed a new middle class with certain very distinct qualities. Work for its own sake gradually became a fetish, and thrift, leading to a steady accumulation of capital, was regarded as an essential part of the good life. The English diarist Samuel Pepys, writing in the 1660's, continually dwells on his growing capital. He could not know that he was the unacknowledged mouthpiece of a new age.

THE industrial revolution in England found ready to hand rich natural resources like coal and iron, a large merchant class eager to seize the new opportunities for profit, ample capital to pay for the new factories and machines and an abundant supply of very cheap labour, consisting largely of women and children uprooted from the countryside and almost unprotected by the law.

New inventions placed at the disposal of the merchant class provided railway and steamship facilities for the rapid transportation of raw materials to their factories, and of manufactured goods to their customers. The Royal Navy guaranteed their safe passage and Lloyd's insured them against loss.

In spite of all these advantages, the English industrial revolution could hardly have succeeded unless a revolution in agriculture had taken place first. This agricultural revolution in Western Europe, led to the growing of more wheat through enclosure of common land, to the rotation of crops, to the winter feeding of cattle and to other improvements in efficiency. It was less spectacular than what happened soon afterwards in the factories, and it is much less vivid in our minds. Yet the two movements were intimately connected.

Before any large-scale economic development can take place in an underdeveloped country, the output and efficiency of its agriculture must be increased. The growing populations of the cities and industrial areas must be fed, because they are not self-supporting, as are the villagers. The country-dwellers must also be able to produce more food in order to earn higher incomes by selling surplus produce, or they will be unable to buy goods from the factories, and the industrialists will be without an essential market. It was fortunate for the nineteenth-century England that these technical changes on the farms had largely taken place by the time the first factories were being built.

CONT'D ON PAGE 32

ENGINEERING
The Spanish Conquistadores who arrived in Peru in the 16th century found a civilization already highly advanced. The empire of the Incas had an extensive network of well-built roads, a remarkable irrigation system. Using stones of considerable weight, Inca engineers perfected an amazing method of building construction, but were ignorant of the wheel.

© Verger

ASTRONOMY
The ancient Mayas, in the first centuries of our era, were highly skilled astronomers. Through their celestial observations and mathematical calculations they worked out a complex calendar which is considered more exact than the present-day Gregorian one.

Buffalo Museum of Science

© Giraudon, Paris

"A History of Technology"
Oxford University Press

WEAVING
More than 4,000 years ago in Peru cotton was grown and woven into such striking patterns as that of this poncho from Narca (opposite). Cotton was not raised until the year 500 B.C. in the Nile Valley. Early Egyptians cultivated and spun only linen and hemp.

Collection Cleveland Museum of Art

WORLD PIONEERS OF TECHNOLOGY

This 16th century map of the voyages of Magellan shows only a few of the vital contributions which many of the so-called "underdeveloped" countries have made in the past to the technological and scientific development of today's industrialized society.

THE COMPASS

It was largely thanks to the compass that Portugese and Spanish explorers found distant lands in the 15th century. But Chinese sailors were the first to navigate with a magnetic needle in the 7th century.

© Bulloz, Paris

INIAG, Paris

PRINTING

The oldest known printed document dates from the 8th century in China. Chinese paper was first manufactured in 105 A.D. Printed impressions were made from engraved plates until 1041 when, centuries before Gutenberg, the Chinese Pi-Chang invented the first movable type.

MEDICINE

The world's first medical treatise dates back to 2700 B.C. under the Chinese Emperor Chen-Nong (opposite). Some thousand years later the Babylonian King Hammurabi decreed a series of laws governing the practice of medicine and surgery. By the year 500 Indian scholars had identified 700 medicinal herbs.

"La Médecine chinoise," Ed. Dacosta, Paris

SHIPBUILDING

Egyptian sailboats cruised the Mediterranean in 1500 B.C. Under Rameses II Egyptian sailors voyaged by canal from the Nile to the Red Sea. Sizeable naval squadrons from Egypt penetrated the Indian Ocean in 1200 B.C., probably as far as Sumatra, in ships 220 feet long with large crews.

A History of Technology
Oxford University Press

METALLURGY

Mining of copper, silver, and gold and the making of glass was current in Mesopotamia and Egypt 6,000 years ago. Iron was not discovered until 1,000 years later in the same countries. Above, an iron axe decorated with copper and gold (1300 B.C.) found at Ras Shamra in Syria.

MATHEMATICS

Mathematics owes much to the Orient. The formula of Pythagoras' theory is found on Mesopotamian clay tablets dating back to 1770 B.C. In 400 A.D. India produced one of the early mathematical treatises, the "Surya Siddhanta," and during this period gave the world its first recorded works on algebra.

Yale University

WRITING

Three thousand years before Christ the Sumerians had an alphabet of 500 to 600 characters one hundred of which were phonetic. Tablet-writing in Mesopotamia (opposite) progressed steadily to cuneiform letters. By 1300 B.C. the library of the Hittite capital, Hattusa, held texts in 8 tongues.

Oriental Institute, Chicago

Can ancient values survive a machine age?

But even the agricultural revolution at home would not have sufficed to feed the rapidly growing population, which was concentrating more and more on work that did not produce food. Just at this moment, another fortunate circumstance came to the help of the manufacturers and businessmen. Broad farmlands were being opened up in North America, Argentina, Australia and New Zealand from which ample supplies of wheat, meat and dairy produce were to flow to the crowded cities of the United Kingdom in return for her eagerly desired manufactures.

The historian cannot explain why European thought took the direction it did at the dawn of "modern" times or precisely why the industrial revolution occurred just when it did and how it did. Nevertheless, he has no difficulty in pointing out the contributing factors at which we have glanced, factors that help to explain why progress was so rapid. When we turn to the problem of economic development in our contemporary world, it is obvious that conditions differ in many important respects from those we have been considering.

Many of the underdeveloped countries of today do not possess the raw materials required for industrialization. Still more important, few of them have undergone the long preliminary period of social change which took place in England before the industrial revolution began there. In particular, most of these underdeveloped countries have never seen the emergence of a powerful mercantile class with the enterprise, the experience and the accumulated capital, as well as the broad international connexions, which the businessmen enjoyed in England, the centre of a world-wide empire.

In some of today's underdeveloped countries, the small educated class has tended to despise commercial and industrial pursuits, while lack of education and capital has prevented the mass of people from using trade as a means of substantially improving their condition.

Perhaps most fundamental of all is the different philosophy of life obtaining in many of today's underdeveloped countries. The success of Western technological civilization has depended upon the willingness of large numbers of men persistently to devote their energies to the acquiring of material goods and social prestige symbols. The habits of industry, thrift, accumulation of capital and shrewdness in the far-sighted employment of it opened the doors of society, while earning the plaudits of moralists. As the twentieth century advanced, the desire for possessions and security has been intensively stimulated, lower and lower down the social scale, by all the resources of professional advertising.

It would be a mistake to suppose that, even in the West, man has always been eager to make this effort. In fact, lack of discipline and absenteeïsm were among the most serious obstacles to economic progress in the early factory age. A contemporary observer, Andrew Ure, in his *Philosophy of Manufacture* (1835) remarked: "The main difficulty of the new industrial system did not, to my apprehension, lie so much in the invention of a proper self-acting mechanism...as in training human beings to renounce their desultory habits of work and to identify themselves with the unvarying regularity of the complex automaton... Even at the present day, when the system is perfectly organized and its labour lightened to the utmost, it is found nearly impossible to convert persons past the age of puberty, whether drawn from rural or from handcraft occupations, into useful factory hands."

Long ago, Aristotle said in the *Nicomachean Ethics:* "We busy ourselves in order that we may have leisure" and it has been pointed out that the Greek language has only a negative word for "job" or "business"—*asxolia*, literally "the lack of leisure." The Latin equivalent for "business" is *neg-otium* or "absence of leisure." The German for work—*arbeit*—comes from a Middle High German word, *arebeit,* which had the meaning of "hardship" or "distress."

We have contemporary evidence to show that it took much effort and not a little brutality to create in the early factory workers the habits of unremitting attention and regularity that machinery demands, habits which, in the fields and the artisan's shop, can be less rigid and exacting, thanks to the relief afforded by varying tasks, seasonal changes, weather conditions, traditional religious festivals and folk ceremonies.

If the discipline of industry took a long time to assert itself in the West, obstacles of a still deeper nature may hinder its development elsewhere. Compare the outlook which is now typical of many Western societies with the traditional attitudes of a civilization like that of India.

There, renunciation and the conquest of desire are principles deeply admired. Matter is the great illusion and desire the root of all evil, a force which draws man into a material world with which his real self can have no affinity, and to which his genuine interests would never bind him. From the standpoint of this ancient culture, the stimulation of material desires and the creation of means to satisfy those desires are in the highest degree vanity and foolishness.

There are, of course, many underdeveloped countries in which these views are not held, or are restricted to certain spiritual teachers and their disciples. Few Indians would today see an irreconcilable conflict between the Hindu religion and an effort to improve standards of living. The existence in non-industrial societies of such traditional attitudes before the great mystery of life and a widespread reluctance to submit for long to the monotony of industrial labour should however be noted.

Critics of the West have pointed out what they believe to be a certain selfishness and superficiality in the attitudes which have made Western industrial civilization possible. They see in Western man a desire to "have" rather than to "be," and they compare this unfavourably with the more communal, less individualistic and acquisitive state of mind that prevails in much of Asia and Africa. There, at least in many rural communities, personal aggrandizement tends to be condemned as a motive for human conduct. Sharing with one's fellows is taken more readily for granted and time is something to be enjoyed, rather than used, like a song by firelight that enriches companionship, even if it leaves the coffers as empty as ever. Such attitudes could perhaps restore to the "acquisitive society" a dimension of human warmth which it has, to some extent, lost. In any event, they cannot be overlooked if we seek to compare the mentality of today's underdeveloped countries with that of industrial England or America.

In the attempt to move from an earlier, rural culture into the mobile, machine-conscious, urbanized, technological society, the "less developed" countries may risk losing precious social values consecrated by tradition and also art forms which satisfy æsthetically as manufactured goods can never do. Only economic development and industrialization can reduce the material sufferings and insecurity of the less privileged peoples, but respect for these social and artistic values may still be a guiding principle both of those who are seeking to diversify their economies and of the experts from industrialized countries who go among them, sometimes without fully realizing what treasures an "underdeveloped" culture may conceal.

(To be continued.)

Letters to the Editor

SPECIAL ISSUES Vs. VARIED ISSUES

Sir,

As you have asked for readers' views on a single or multi-subject policy for your magazine here are mine.

Being partial to a full and adequate treatment of subjects, I naturally prefer by far the one-theme issues of which you have already given us some magnificent examples. Scientific discoveries, artistic treasures and literary masterpieces are not too numerous to prevent your making individual mention of each of their authors and of presenting in a single issue their lives, the history of their works and, above all, the objective and competent judgment of their contemporaries.

Marcel Faelli
Dampremy, Belgium

Sir,

I agree with your correspondent Tom Kloepping (Sept. issue) that THE UNESCO COURIER has lost some of its unique flavour and carries less weight since it ceased to concentrate on the various aspects of one special subject.

Ellen Bosanquet
Falmouth, England

Sir,

It would be a pity if you ceased to publish issues devoted to one theme. These are the numbers of THE UNESCO COURIER that I treasure the most.

Paulette Vassel
Suresnes, France

Sir,

You are making a big mistake when you devote your magazine to a single subject and adopt a dry and official style of presentation. This could make the subjects dealt with more difficult to understand and act as a brake on the expansion of your publication.

P. F. Oloviaguine
Shardjou, U.S.S.R.

Sir,

I prefer *greatly* whole issues devoted to one theme: it makes the issue more authoritative and worth keeping for reference. The UNESCO COURIER in its old form was in an outstanding class of its own and I was always recommending it to friends and to educational institutions.

Cyril Harrison
Birmingham, England

EDUCATIONAL BUT NOT BORING

Sir,

As a fifteen-year-old schoolgirl, I first came into contact with THE UNESCO COURIER when I wrote to the Foreign Office for information about the Aswan Dam. This was for a school competition project which I had entered.

The Foreign Office sent me an issue of THE UNESCO COURIER, partially devoted to Abu Simbel. With its aid I won the project, and decided to subscribe to the magazine.

Since that time I have been entirely satisfied with the articles, which I find to my delight vary widely. I feel that, although I hope to continue on to further education on the side of the arts, my education could not be complete without some knowledge of science, people, ancient civilizations etc. which the magazine deals with admirably.

I wish that other people of my own age group knew about it. It is educational, without being boring, unlike so many textbooks.

Deborah Parker
Wirral, England

NEW WAYS IN ASIAN MUSIC

Sir,

I agree wholeheartedly with Alain Daniélou "Music of the Orient", June 1962 issue, that international music education is a worthwhile step towards the understanding of other cultures and that this is best accomplished today by means of recordings and radio. I must however take exception to several of his statements.

Music is a form about which we are all most subjective but, who can say that "new forms and innovations in Asian music destroy the meaning"? Should we not think of them as additions rather than destructions? A new face doesn't mean that the heart is gone.

As a student of the instrument pictured in the hands of Ravi Shankar I feel that some mistake must have been made in the captioning. Though it is true that India's stringed instruments have been lumped together as "vinas", the instrument shown is best known throught the world as the "sitar". It is indeed difficult to describe these instruments because of the wide variation in each type but a careful look at the photograph will show that this one has twenty frets, seven main strings and thirteen sympathetic resonating strings on a fingerboard of teakwood.

P. Estabrook
Bombay, India

Ed. note: Professor Daniélou (who did not write our captions) says:

"The instrument is a Indian Sitar. It has four main strings, two or three drone strings, and 13 *sympathetic strings tuned to the various notes of the mode and that help to increase the resonance of the instrument. These cannot be called drone strings. The number of frets is usually* 20.

On the photograph of an Indian painting next to that of Ravi Shankar, the instrument is an Iranian sehtar (not an Indian instrument). The musician may be Persian or Indian."

LITERACY IN SWITZERLAND

Sir,

The use of statistics is always somewhat questionable as one never knows how the figures have been arrived at. New evidence of this is given in the pages of your June 1962 issue where we read how illiteracy has been rapidly reduced [to 3.5%] in Cuba under Castro, and you then place Cuba's illiteracy on a par with Switzerland and other countries. On this basis, Switzerland would have 20,000 illiterates which is certainly far from the truth.

Franz Köller
Benken, Switzerland.

Ed. note: Our reader is correct. Illiteracy is practically non-existent in Switzerland and cannot be put on the same level as that of Cuba. The parallel with Switzerland was drawn by the Cuban Ministry of Education in a report communicated to Unesco which indicated that Cuba's illiteracy percentage was 3.5 %.

HAZARDS OF SPACE DISEASE

Sir,

Anent the letter from Mr. George R. Schäfer in your May issue. Speaking of the two-way problem of disease-causing agents in space ventures, and perhaps of interest in connexion with your forthcoming special issue on the Conquest of Outer Space, note is made of the fact that two years ago I published a short item in the American journal "Science" [vol. 132, p. 1569 (1960)] stating that it was time to begin investigations into the production of germ-free humans.

Of course, it would be out of the question to take a human infant and raise it germ-free; however, the notion seems entirely feasible for adults who have developed a full complement of anti-body and other defense mechanisms, so that they could be returned to their natural environment with a minimum of danger.

As for "space disease" brought back to earth, it appears that an important gap will have to be filled. Namely, the gathering of extra-terrestrial infectious agents (which in all probability exist) by specially-designed, unmanned vehicles, and bringing these back to earth for "space bacteriology" and like examinations having the aim of developing or using present disease countermeasures.

It is not inconceivable that "space disease" could provide a major hazard for manned expeditions.

Jack DeMent
Portland, Oregon, U.S.A.

From the Unesco Newsroom...

INTERNATIONAL TV BY TELSTAR: For the first time, on September 17, an intercontinental TV programme was transmitted by the communications satellite Telstar. It was a U.N. programme, honouring the memory of Dag Hammarskjold, former U.N. Secretary-General, Count Folke Bernadotte, U.N. Mediator for Palestine and others who died in the cause of peace, and was seen by audiences on both sides of the Atlantic. It included ceremonies at U.N. Headquarters, New York, Unesco Headquarters in Paris and at Dag Hammarskjold's tomb in Uppsala, Sweden.

RENE MAHEU CANDIDATE FOR DIRECTOR-GENERALSHIP: The Executive Board of UNESCO, after meeting in Istanbul in September, announced its decision to submit for the approval by the General Conference of the Organization which opens in Paris on November 9, the nomination of Mr. René Maheu, Acting Director-General, to the post of Director-General of UNESCO.

GIFT COUPONS HELP UNRWA: Over $170,000 to aid UNRWA Arab Refugee Camps and Schools (See THE UNESCO COURIER, October 1962) has been raised in the past ten years by schools, organizations and individuals in twelve countries and donated through UNESCO Gift Coupon Scheme projects. This aid came from Australia, Belgium, Canada, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, the United Kingdom and the U.S.A. Unesco's current project (GCP N° 324) invites contributions for provision of science teaching equipment, domestic science materials, school libraries and youth centres.

HONEY IN THE DESERT: Experiments have now shown that bees can live happily, busily, and profitably in the Kara Kum and Kizyl Kum deserts of Uzbekistan U.S.S.R. thanks to the thorn and wild desert grasses which blossom in summer. Many collective farms are now setting up apiaries in these areas, but to protect busy bees from heat prostration, their hives must be set up under tents which are kept sprinkled with water.

SAVING THE ORYX: An expedition recently set out for the Rub al Khali desert of southern Arabia in search of specimens of the Arabian oryx, a rare, long-horned species of antelope which man has almost succeeded in wiping out. In the past there were large numbers in the Middle East. but they have been progressively hunted down. An aerial survey earlier this year revealed only seven specimens surviving. The Fauna Preservation Society in London with the support of the World Wildlife Fund sent the present expedition to capture the remaining animals and fly them to a place of safety, probably somewhere in Africa.

AGAINST DISCRIMINATION IN EDUCATION: The U.S.S.R. has become the seventh country to ratify the Convention Against Discrimination which was adopted in 1960 by the UNESCO General Conference. Designed to promote equality and justice in access to education, the Convention defines discrimination as including any distinction "based on race, colour, sex, language, religion, political or other opinion, national or social origin, economic condition or birth."

'CULTURAL PASSPORTS': The Hague Art Foundation in co-operation with the city authorities is now issuing "cultural passports" to young people aged between 15 and 20. These passports provide entry to exhibitions, art galleries and museums and enable the holders to enjoy theatre, music, ballet, opera and film performances at reduced prices.

VOLTAIRE'S LIBRARY: A detailed description of Voltaire's library, which was purchased by Catherine II of Russia after the death of the great 18th century philosopher, has now been given in a book published by the U.S.S.R. Academy of Sciences. Voltaire's many notes, on the margin of his books, are rich material for research. Especially noteworthy are letters he received from the Russian scientist Mikhail Lomonosov.

WORLD CAMPAIGN AGAINST MALARIA: Over 90 postal authorities are now taking part in the vast philatelic campaign, "The World United Against Malaria", launched by the World Health Organization last April. Proceeds from the stamps will be used to advance the WHO campaign to eradicate the disease that threatens 1,300 million people today. Already 764 million people are covered by malaria eradication programmes.

FREEING KNOWLEDGE FOR ALL: New Zealand and Gabon are the latest countries to join the UNESCO Agreement on the Importation of Educational, Scientific and Cultural Materials which exempts these materials from import duties. So far 39 countries have joined the Agreement which is part of UNESCO's programme to promote "the free flow of ideas by world and image."

SCHOOLS AT SEA: Over 600 senior boys and girls from secondary schools in France and Britain recently went on a cruise to Morocco, Senegal and Gambia on a ship specially fitted out as a kind of floating school. During their trip they met African youngsters of their own age and joined in many festivities and excursions.

LIBRARIES FOR DEVELOPING LANDS: To help member states set up libraries which can buttress their educational systems, UNESCO has organized a series of conferences in recent years. Recently it has been participating in three regional seminars organized for the benefit of developing countries: On the development of libraries in Africa (held in Nigeria), of university libraries in Latin America (in Argentina) and on co-operation between libraries and documentation centres in Arab countries (in Cairo).

IN THE STEPS OF ALEXANDER: A team of German film producers, technicians and actors has recently been following a route taken over 2,000 years ago by Alexander the Great on his way to India, through Macedonia, Turkey, Iran and Afghanistan. The expedition will make a full-length documentary film of Alexander's campaigns for eventual screening on European TV networks.

Flashes...

■ *Asia's educational problems are brought home by the situation in India where there are 46 million children of school age—a number equal to the total population of France.*

■ *Oceanographers are making ever greater use of highly developed fixed buoys (unmanned research vessels) to measure ocean currents and temperatures. · Thirty such stations could produce eight million temperature measurements annually.*

■ *Ceylonese fish catches have doubled since 1956, when nylon nets were introduced in Ceylon by a specialist adviser sent by the U.N. Food and Agriculture Organization.*

■ *Twelve countries (the latest of them being Ghana) have joined the International Computation Centre in Rome set up under UNESCO's auspices.*

■ *Africa's present cattle population (about 114 million head) could be doubled if trypanosomiasis (sleeping sickness) which is transmitted to man and animals by the tsetse fly in tropical Africa, were eradicated.*

■ *In the past three years, 1,540 works of fiction totalling 181 million copies have been published in the U.S.S.R. They included books by writers of 68 countries and translations from 45 languages spoken in the U.S.S.R.*

THE UNESCO PHILATELIC SERVICE

The United Nations has chosen U.N. Day, 1962, on October 24 to commemorate its operation in the Congo with the issue of a new stamp (left). As the agent in France of the U.N. Postal Administration, Unesco's Philatelic Service stocks all the United Nations stamps currently on sale. It also has stamps and first day covers issued by many Unesco member states to commemorate important events in the history of Unesco and the U.N. (Inauguration of Unesco's Headquarters, Human Rights Day, Unesco's 15th Anniversary). Information on items available, their price and methods of payment will be sent on request by the Unesco Philatelic Service, Place de Fontenoy, Paris (7e).

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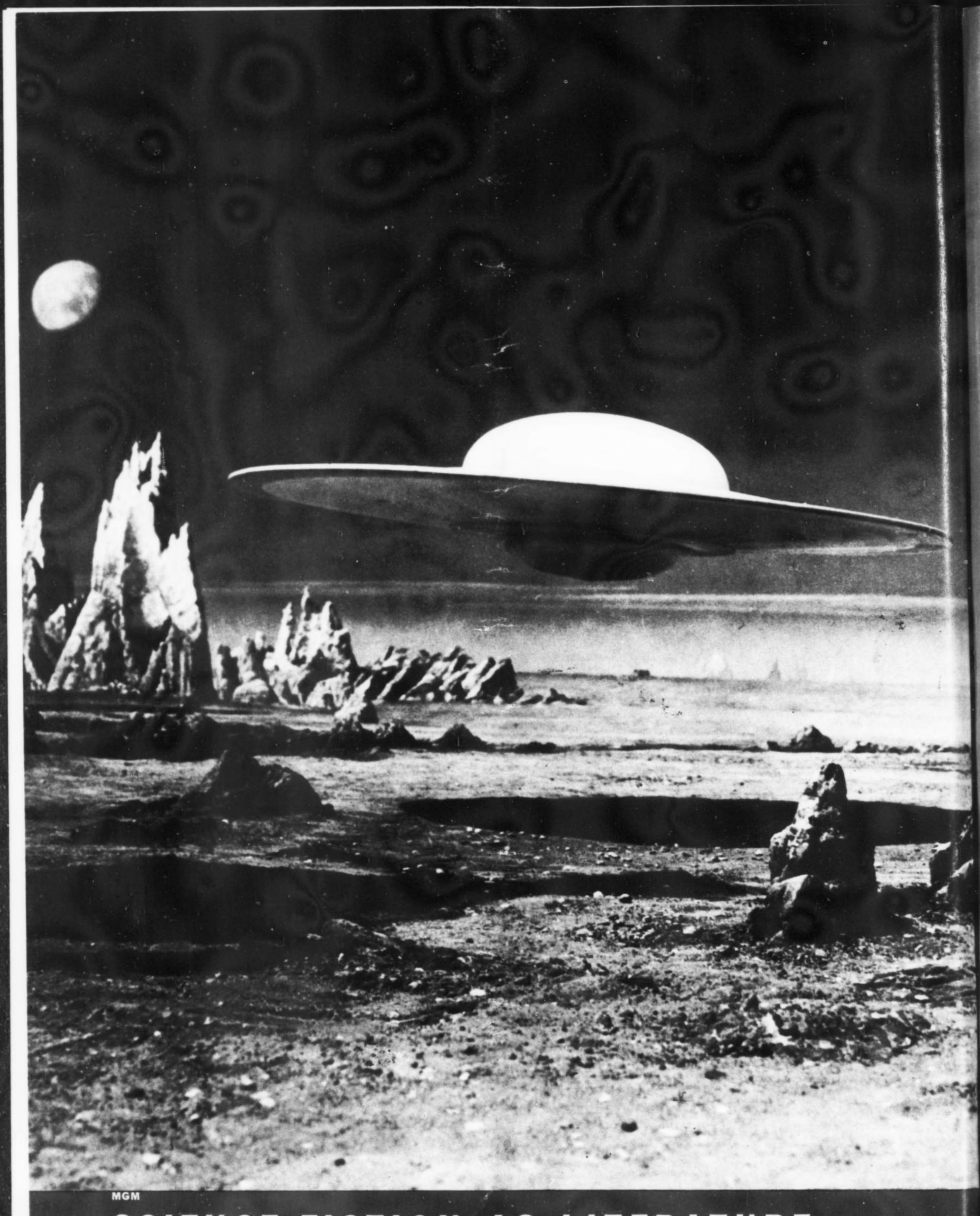


MGM

SCIENCE-FICTION AS LITERATURE

This year's Unesco Kalinga Prize for the Popularization of Science has gone to Arthur C. Clarke, a writer who has made his name in science-fiction. In the article on page 14, Mr. Clarke comes to the defence of science-fiction as a new form of literature worthy of attention and stresses the role it has played in arousing interest in science in young minds. Photo here shows a scene from '' Forbidden Planet '', an American film in which a science-fiction flying saucer sets out from Earth to explore a planet circling the star Altair in the Constellation of the Eagle.

A WINDOW OPEN ON THE WORLD

The UNESCO Courier

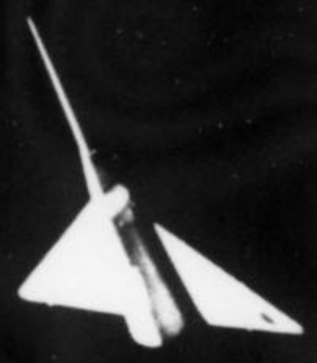
DECEMBER 1962 (15TH YEAR) PRICE : 50 CENTS (U.S.)

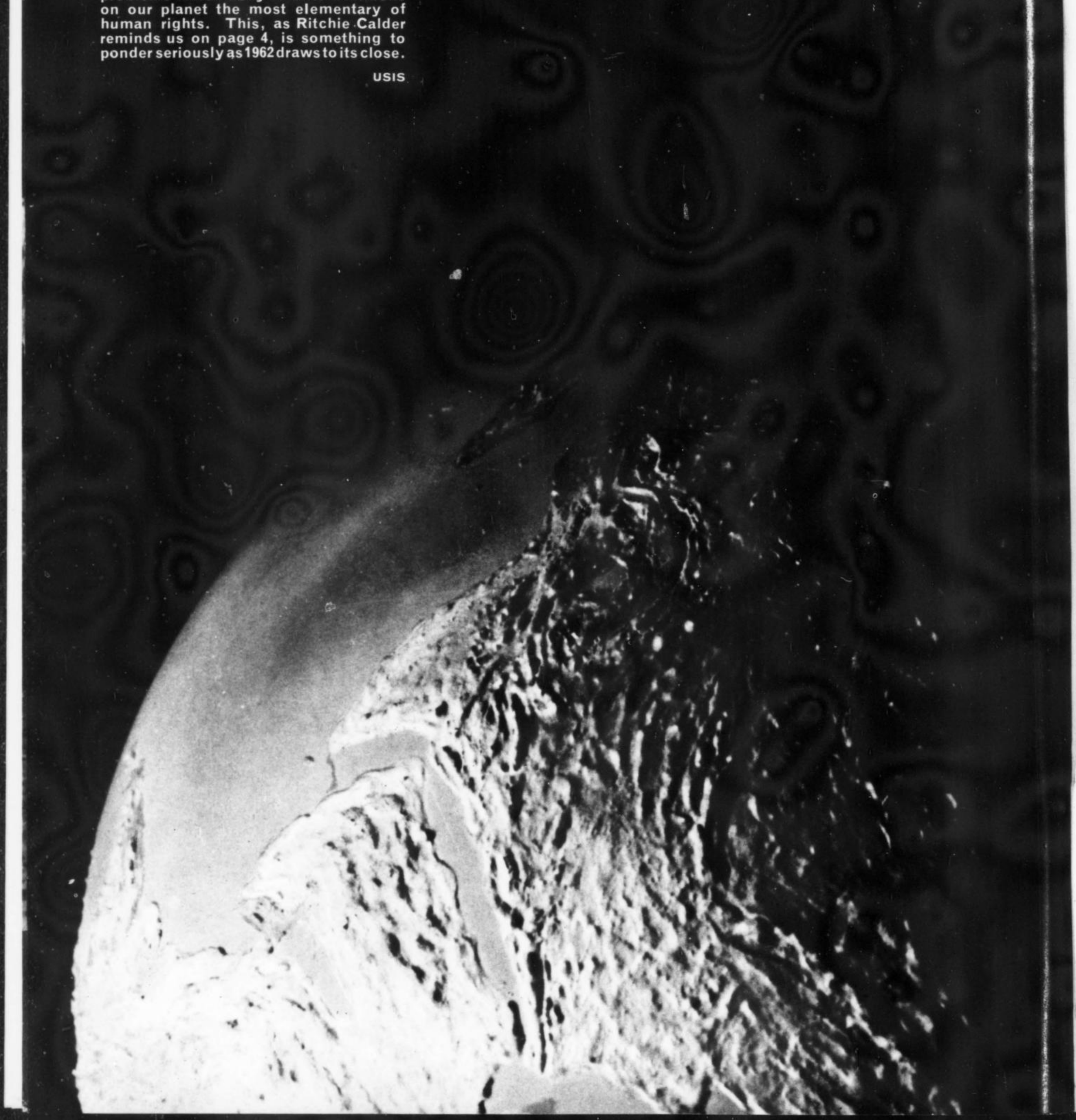
MAN THROUGH HIS ART

EARTHLINGS IN THE SPACE AGE

From an artificial satellite in orbit an eye, human or electronic, sees no political frontiers and no differentiation of races. Today as man embarks on the conquest of space, we should not lose sight of the immense unsolved human problems which deny to untold millions on our planet the most elementary of human rights. This, as Ritchie Calder reminds us on page 4, is something to ponder seriously as 1962 draws to its close.

USIS





The UNESCO Courier
A WINDOW OPEN ON THE WORLD

DECEMBER 1962
15TH YEAR

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No. 12

PUBLISHED IN EIGHT EDITIONS

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French
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Russian
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Arabic
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COVER PHOTO

Sculptured heads, detail from a bas relief depicting an episode from the Hindu epic, the Ramayana, were carved over 1,000 years ago in a gallery of the Temple of Shiva, near Djakarta, Indonesia. They are among the masterpieces of world art chosen to illustrate the theme of "The Human Face" in a 14-volume series of art portfolios to be entitled "Man Through His Art" (p. 11).

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(M. C. 62.1., 175 A)

Published monthly by
The United Nations Educational, Scientific and Cultural Organization
Editorial Offices
Unesco, Place de Fontenoy, Paris 7e, France
Editor-in-Chief
Sandy Koffler
Assistant Editor
René Caloz
Associate Editors
English Edition : Ronald Fenton
French Edition : Jane Albert Hesse
Spanish Edition : Arturo Despouey
Russian Edition : Veniamin Matchavariani (Moscow)
German Edition : Hans Rieben (Berne)
Arabic Edition : Abdel Moneim El Sawi (Cairo)
Japanese Edition : Shin-Ichi Hasegawa (Tokyo)
Layout & Design
Robert Jacquemin

THE UNESCO COURIER is published monthly, except in July and August when it is bi-monthly (11 issues a year), in English, French, Spanish, Russian, German, Arabic and Japanese. Sales and distribution: UNESCO Publications Center. U.S.A. 801 Third Avenue, New York 22, N.Y., Plaza 1-3860 (sole distributors of the U.S.A. edition). Second-class mail privileges authorized at New York, N.Y.

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The Unesco Courier is indexed monthly in The Readers' Guide to Periodical Literature.

Annual subscription (any edition): $ 5.00 ; Single copies : 50 cents.

All correspondence should be addressed to the Editor-in-Chief in Paris.

As the year 1962 draws to a close, The Unesco Courier submits the following article to the contemplation and reflection of its readers. The article is the inaugural address that Ritchie Calder delivered in November 1961 after his appointment to the Chair of International Relations at the University of Edinburgh. Winner of the Unesco Kalinga Prize for the Popularization of Science, Ritchie Calder is well-known to our readers for the many articles we have published in past issues.

EARTH

Sixteen times a day, a man-made satellite can circumnavigate the earth

By his own ingenuity, *Homo sapiens,* the Earthling, has shrunk his world to the dimensions of a very small planet. In the arrogance of our conceit, which puts Man and his brain at the very centre of the universe, we have never been quite convinced by the astronomers when they have tried to tell us how insignificant the world is in the immensities of Space. But now the Space Engineers, and the Astronauts, beating the bounds of our global parish, have reminded us how relatively small it is.

In the spirit of new adventure, one may regard the world as a departure-platform for fugitives to the moon or a launching pad for escapades to other planets or even beyond our solar system, into other universes. But the Earthlings who cannot so escape must recognize that on its relatively limited surface, 3,000 million people today, 4,000 million in twenty years' time, and 6,000 million or 7,000 milion forty years from now, will have to contrive to live and to work together. Or by the neglect of wisdom or the abuse of human ingenuity, to die together.

An eye, human or electronic, in an artificial satellite in orbit, sees no political frontiers; no ideological curtains; and no differentiation of races. It might see H-Bombs going off as the signals of tensions. It might see the smoke of industrial cities, distinguishing the highly-developed, from the underdeveloped, countries; but, in general, it would see a globe of which only three-tenths was land and seven-tenths covered by oceans; mountain ranges reduced to wrinkles; evidence of surviving forests; tawny expanses of hot deserts which cover a fifth of its surface and cold deserts which cover another fifth. It might with difficulty distinguish the pattern of cultivation, of arable or cropped lands, which accounts for only one-tenth of the land-surface. That is the nature of humanity's family estate of which, at the moment, we are the improvident stewards.

The world is not just the relic of a cosmic incident

It provides the biosphere, the living-space, for the evolutionary process which, we like to think, had its consummation in Man.

But with a wisdom which we have not demonstrated convincingly so far, we must recognize that that biosphere and that evolutionary process include other species with which we can coexist or which we can stupidly destroy. Stupidly because our relations with these other species are a condition of our own survival.

A lump of soil no bigger than a football contains a micro-organic population greater than the human population of the world. That micro-organic population includes the germs and fungi which evocatively suggest disease or danger but which, in other forms, are indispensable to our existance. In the same way, we think of insects as deserving insecticide and other creatures as deserving pesticide, but in the process we can kill those which are essential to our ultimate needs.

For example, in order to get margarine, we cleared big areas in Tanganyika of brush and tsetse flies which it harboured, but in the process we got rid of the bees which were needed to pollinate alternative crops.

Similarly, for our short-term, and short-sighted, needs we have destroyed the vegetation cover. We have cut down forests—the Sunday edition of one American newspaper consumes in a single year the yield of a forest area half as big again as that of my native county of Angus. We have damaged the vegetation cover in other ways, preventing the absorption of water by the natural sponge through which it seeps into the underground springs. As a result the scouring rains sluice the soil off the hills, cause floods and eventual erosion.

In the lifetime of the United States, over two hundred and eighty million acres of arable, crop and range land have been destroyed—more than ten times the productive acreage of the United Kingdom.

In the 1930's there was the apocalyptic warning when the midday sun of New York was blotted out

—by the dust of the Dakotas over a thousand miles away. But only five years ago, the airliner on which I was flying to Winnipeg could not land because at noon we had flown into night. When we finally broke through it was to find the city and everything in it covered with khaki mud, spread by the rain which had enabled us to land.

The "night", the pall which had blotted out the sun, was dust. At 8,000 ft. the dust had been that of Texas 1,500 miles away. At various levels, the samples were from Oklahoma, Nebraska and the Dakotas. The heavy particles nearer the ground were those of Manitoba itself. We had been caught in the climax of a dust storm which had whipped topsoil from the middle of a continent.

Only slowly—and recently—have we come to recognize that wild animals are not something with which mankind is at war but a part of the balance of life, which is delicately adjusted. Recently, I was at the Arusha Conference, in East Africa, called by the International Union for the Conservation of Nature, under the sponsorship of UNESCO and the Food and Agriculture Organization. It was an emergency meeting because so many new states are becoming independent and the naturalists of Europe and America were afraid that the Africans might decimate the game animals by slaughter and destroy their habitat by immature husbandry and indiscriminate cattle-raising.

It was gratifying, and at the same time humbling, to find that the Africans themselves were traditionally more aware of the role of wild life in their

HLINGS IN THE SPACE AGE

by Ritchie Calder

own ecology than the white man has hitherto shown in his intervention in that continent. The African recognized that in the precarious nature of the savannah lands, big game—and even the tsetse fly—were a decisive factor.

Nearly four million square miles of the African continent are held in fief by the tsetse fly. Because of the fatal diseases which its bite produces in man and his domesticated animals but does not produce in the wild animals, the tsetse has preserved great tracts which might have been destroyed by shifting cultivation and by over-grazing.

It was suggested at Arusha that a monument ought to be raised to the tsetse fly as "The Saviour of Africa" and it was Africans who insisted that before modern methods to remove the tsetse were employed, their people must be trained to husband well this legacy of land.

More than that, Prime Minister Nyerere of Tanganyika, volunteered the Arusha Manifesto pledging his government, with the endorsement of all Africans present, to preserve the wild life and their habitat "for their children's grandchildren."

This kind of wisdom, this recognition of a world we share, not only with other people but with other creatures, has not been conspicuous in those nations which we call advanced, or scientific.

In the past, civilizations have developed in localities or regions. They have flourished and decayed but always another civilization could succeed them. Today, ours is a global civilization. It is not bounded by the Tigris and the Euphrates; it is the whole world. It is a closed community so interdependent that every mistake we make is exaggerated on a world scale.

For the first time in history, man has the power of veto over the evolution of his species. We share the biosphere. Into that we have injected, in the past sixteen years, man-made radioactivity. Elements which did not exist in nature have been indiscriminately scattered over the face of the earth, to combine in all living things.

Today there is not a child in the world that does not have radiostrontium in its bones

—At least to some degree. The amounts may be insignificant and the possible effects may be emotionally exaggerated and medically in dispute. Much is unproven, much is unknown. But that only emphasizes that men, on defective evidence or in positive ignorance, are recklessly tampering with the biosphere on which the present and future of their race depends.

We have had plenty of reminders of the dangers of neglecting Claude Bernard's warning to his fellow-scientists a century ago—"True science teaches us to doubt and in ignorance to refrain." Radiostrontium was overlooked in the calculations of the possible effects of H-bomb testing, because the mechanism by which radioactive krypton decays into strontium-90 had not been taken into account and because the mechanism of stratospheric storage and the reappearance of radioactive particles in the atmosphere had not been realized.

Nature, with grim irony, brings the radioactive chickens home to roost. Nuclear tests may be made in remote places—the Marshall Islands, Christmas Island, the Sahara, behind the Urals or in the Arctic, but the radioactivity will reappear in the countries which originated such tests—as well, of course, as countries which were not party to them.

Whether exploded near the Equator or beyond the Arctic Circle, the radioactive garbage of those bombs will be swept into the jet streams of the Radioactive Forties, the latitudes which include the United States, Britain, France and the Soviet Union.

This, with all the emotional and political overtones which it produces in international relations, is another reminder that we all share one biosphere and of the global risks of tampering with it.

It took *Homo sapiens* at least 200,000 years to multiply and reach the present figure of 3,000 million

It will, on present trends, take less than forty years to double that figure. There is no way, short of cataclysm, man-made or otherwise, by which the figure can be less than 4,000 million by 1980. It may be more but it cannot be less.

In the lifetime of the younger politicians of today the Demographic Revolution, which takes no account of political ideology, will have completely changed the pattern of world politics. Whereas at the beginning of this century, there was one European to every two Asians, by the end of this century the ratio will have become 1 to 4—and here the term "European" includes the entire Soviet Union. Latin America will, in the twentieth century, have increased its population tenfold and the remaining continents will have increased fourfold.

As the experts of the United Nations said in *The Future Growth of World Population*—"We are swimming against the tide of evolution but having discovered how to increase the flood, we have not also, through biological science, the means of arresting it." In the next twenty years, we have—inescapably therefore—to contrive to provide board and lodging for a least another 1,000,000,000 people.

In fact, it means that, in political wisdom as well as decent humanity, we have to double the present food supply because more than half the world's population is undernourished and the pressures upon the governments of new states are to provide proper nourishment.

I have, in the past fourteen years, been among the wandering Bedouins in the desert, the Dyaks of Equatorial Borneo, the Eskimos in the Arctic, the peoples of the hinterlands of Latin America and Africa and Asia. In one way or another their lives and their destinies have been consciously touched by scientific and technological achievement.

Many of them have acquired their freedom—there are nearly twice as many nations in the U.N.

CONT'D ON NEXT PAGE

as there were when it was founded. But when the intoxicating effects of political independence wear off, there is the morning-after-the-night-before.

People are apt to wake up and discover that freedom has been robbed of its meaning; that they are just as hungry, or more hungry; just as poor, or more impoverished; just as sick or more disease-ridden, and just as frustrated in their seeking for a better way of life.

But there is a new factor in their frustration: they know that the wit of man can produce more food and that disease is not the will of the gods but can be cured by means available to man and that there are so many things which they knew they wanted but now know they need.

Through the limited—financially that is—activities of the U.N. agencies, of the U.N. expanded technical assistance fund and now of the special fund and by the much more lavish examples of bilateral aid, people have been shown what is scientifically and technically possible. But it is not enough to show them.

To demonstrate what might be done to people who have not the means to do it is just tantalizing. It is just "window-shopping"—walking along Princes Street with nothing in your pocket and with plateglass between you and the things you have been taught to want.

The peoples of the emerging countries have not the means to go shopping in the supermarket of science

—As Prof. P.M.S. Blackett has termed it. They cannot even afford the bargain basement.

We say, and are emphatically right in saying so, that the object of this kind of assistance is to help people to help themselves—throwing them a rope with which to haul themselves out of the morass of poverty. But this is no Indian rope-trick—the rope has to be tethered to something, and a winch would help to haul them out more quickly. As it is, the rope is slipping.

After ten years of this new social philosophy by which governments acknowledged that they were responsible, not only for their own people, but for other, less fortunate peoples as well, the gap between the prosperity of the highly-advanced countries and the poverty of the countries struggling for development has not closed—it has widened. The rich countries are richer and the poor countries are poorer—despite the thousands of millions which have been spent on aid.

The explanation is not that this aid has been squandered—although some of it has, because it was given for the wrong motives and applied in the wrong ways or because the recipients themselves have misused it.

But the true explanation was that of the late Dag Hammarskjold. He pointed out what the phrase "You've never had it so good" meant in reverse—in the underdeveloped countries.

"A fall of only 5 per cent in the average of their export prices is approximately equivalent to the entire inflow of capital which they receive not only from International Bank Loans but from all other public and private loans and government grants."

The prices of some staple primary products of those countries—to the advantage of the richer countries which buy them—have dropped, not 5 per cent, but from 10 to 47 per cent! One cannot dissociate that from the political consequences.

Such circumstances have, in this closely interdependent world, global repercussions. This was very succinctly put by Mr. Ernest Bevin when, as Foreign Secretary, he was trying to convince an audience of Lancashire housewives that foreign affairs were kitchen politics. It was at the time of a worse-than-usual fat shortage. He said:

"You complain because you can't get fish suppers in Lancashire. Why can't you get fish suppers? The Fleetwood trawlers are bringing in the fish and there's plenty of potatoes. But the fish-fryers can't fry. And why can't they fry? Because there's trouble in Burma and because we haven't got things straightened out in Siam. And because of all that India can't get rice from these countries. And because India has to grow more food for its own people, we can't get groundnuts from India. And because we can't get groundnuts from India, the fish-fryers can't get the oil. And you can't get your fish and chips."

Governments, when the markets skid, cannot "lift themselves by their own bootstraps" or, if they do, it is by duress. In the meantime their peoples will endure the Misery-Go-Round of Poverty.

Sick people cannot work to procure, or earn, food. So they are undernourished, and because they are sick and undernourished they remain ignorant, because the sick and hungry cannot learn how to improvise or improve their condition. And because they are sick and hungry and ignorant, they remain poor and endure squalor, and because they live like animals they breed like animals.

With more mouths to feed, there is less food for everyone. And so the roundabout of wretchedness goes on. Democracy is a word which echoes meaninglessly in empty bellies.

Dr. Sen, the Director-General of F.A.O., has launched "The Freedom from Hunger Campaign." He might not have had to do so if his predecessor, Lord Boyd Orr, had not been frustrated in his efforts to set up a World Food Board, fourteen years ago. It would have taken politics out of food and food out of politics; in the phrase of former Mayor Fiorello La Guardia of New York, "It would have taken human lives off the ticker-tapes." It would have ensured that food would get into the bellies of people who need it and that farmers would not suffer from over-production.

Per capita until this year we have had, globally, enough calories, even for the increasing world population. But that, too, is grossly misleading. What is important is not *per capita* but *per stomach* and more than half the world's population have not enough to eat, and, short of death from starvation, have never had food adequate for well-being.

By 1960 the total world stocks of surplus grain had reached the incredible figure of 125,000,000 tons

—Enough to provide the full calorie needs of 450,000,000 people for a complete year. Or an extra 200 calories a day to the Asian population for more than three years—as Dr. Norman Wright, Deputy Director-General of F.A.O., points out in the valuable British Association symposium published as *Hunger: Can It Be Averted?*

No one should be so foolish as to think that the distribution of those vast surpluses, even if it were possible would solve the problem of hunger. Relieving immediate stresses, yes. By distribution through such agencies as UNICEF, yes. By turning food into currency, yes. Supplies of food can be made available to governments to help present needs and the proceeds can be used by a government to help its own agriculture to increase its yields in future years. That is the only permanent solution—to enable countries and regions to produce their food requirements.

It can be done. We do not need to imagine food artificially produced by photosynthesis. The scientific know-how already exists. The knowledge we

have got, applied with wisdom, can increase the yields from existing acreages. By plant-breeding we can extend the food-growing acreages into what seemed inhospitable regions.

The UNESCO Arid Zone Committee has done remarkable work in showing how deserts might be developed. I have no doubt, having been in the Arctic seeing whether it might become part of our habitable world, that production, if need be, can be extended there.

As far as those oceans which cover seven-tenths of our globe are concerned, we are at the cave-man stage.

At sea we hunt our food and do not husband it Sea-farming and sea-ranching are perfectly feasible

The great international survey of the Indian Ocean, sponsored by UNESCO, in which 25 survey ships of 15 nations are taking part, will not only tell us a great deal about that birthplace of the monsoons but also about its biological possibilities and its food prospects.

The World Health Organization and the United Nations Children's Fund have done a great humanitarian work in conquering disease and relieving suffering. It is not too much to claim that, with their very considerable help, modern medicine, with scientific drugs, such as penicillin, has saved more lives in the last ten years, than have been lost in all the wars in human history. Drugs are the instruments of death-control and, as such, have part responsibility for the rising tide of population.

But reverting to our Misery-Go-Round, I would remind you that ill people cannot produce, or earn, food. Well people can. In rice-growing regions, the critical, and very manual, functions of transplanting and harvesting rice coincide with the malarial seasons. Three out of five may be sick of the fever. Relieved of malaria, there will be five pairs of hands and the yields will be increased. Malaria control extends acreages by recovering land from the mosquito and clearing malarial jungle for cultivation.

Yet even this work is in hazard. Malarial control, through modern insecticides, has freed hundreds of millions from the fever. But the mosquitoes are developing insecticide resistance and are multiplying and what was endemic malaria may become epidemic malaria. It is a race between Man and the Mosquito.

It means malaria eradication, not just control. If, by modern drugs which are available, the parasite of malaria can be removed from the blood of humans before the resurgence of the mosquitoes, there will be no disease for the mosquito to transmit. It is perfectly feasible. What is needed is the will and the financial support of governments for the World Health Organization's Campaign.

Recently, the United Nations held in Rome a conference on "New Sources of Energy." Ironically, atomic energy was never mentioned. The *new* sources were the oldest of all—sun, wind and geothermal energy, the heat in the crust of the earth. It was a "Do-it-yourself" conference—telling the developing countries how they might contrive, improvise, and adapt methods of harnessing the sun and the winds to their domestic and industrial needs.

We found that geothermal energy has immense possibilities. We have thought of it, up to now, as the self-evident showings—the geysers, the bubbling mudpools and the gases escaping from rock fissures. Such sites have been usefully developed for power and the production of electrical energy in Iceland, California, New Zealand and Italy.

But it has been shown that drilling into the geothermal structures, of which these are just the obvious manifestations, will give temperatures even twenty times as high as the open leaks. It is possible to tap off as required—develop power units to suit requirements, which, of course, is just what developing countries need. They have to have power-units with which their infant industries can grow up—as our Industrial Revolution did, from factory steam engines to the industrial conurbations with huge generating stations.

Now here is an interesting fact: the First Industrial Revolution derived from access to fossil fuels —coal in the first instance, and then oil and natural gas. But, as the World Power Conference has consistently reminded us, there is a geographical and geological "joker" in this. Over nine-tenths of all the accessible coal and eight-tenths of the proven oil is north of Latitude 20 N.

So the countries outside that zone, including most of the countries we now call underdeveloped, could have no role in the First Industrial Revolution except the one they had as the providers of food and raw materials for the workers and factories of the fossil-fuel countries.

But if we look at the configurations of geothermal energy, we can identify it with the great volcanic arcs. From Kamchatka, through Japan, the Philippines, Indonesia, the South Pacific Islands, to New Zealand. From Alaska, down the west coast of Canada and U.S.A. to Mexico, Ecuador, Peru and Chile, to Terra del Fuego. From Iceland, via the great range of submarine volcanoes, through Tristan da Cunha, round the Cape of Good Hope. Another down the Great Rift from Ethiopia, through Uganda, Congo, Kenya, Tanganyika and Mozambique.

Then there is a geothermal region from Italy through Greece and the Middle East to Afghanistan. Note that nature has provided geothermal energy in places where it failed to provide fossil fuels. With U.N. help countries are to look for this source of energy which, by default of atomic energy, may speed their development.

For the first time in history, Man, the Earthling, has the power of veto over continuing evolution

He can exercise that veto by the nuclear destruction of the race, or, by default in handling the problems of starvation, prove that Malthus was right.

He can ambitiously reach out to the farther planets, but his species as such must survive on the surface of the earth, subsist from the nine inches of top-soil which feeds, clothes and shelters him or from the seas from which he emerged hundreds of millions of years ago.

All the majesty of his mind can be dethroned by his stomach. Man can feast like Belshazzar and ignore the writing on the wall. He can spend £40,000 million a year on the defence of peace and ignore the real content of the peace he is supposed to be defending. He can say, "My group, at least, shall survive", and like the locust-men of Attila, Genghis Khan and Tamerlane and Hitler, try to wrest *lebensraum* at other people's expense.

He can split the atom and release the power of matter and use this, his greatest discovery, to poison the goodness of his earth and destroy his species. He can outboast the Ancients, who in the arrogance of their material success built pyramids as the gravestones of their civilizations, for Modern Man can throw his pyramids into Space and they may orbit eternally round a planet which died of his neglect.

Or he may choose to use his science and his wisdom to co-operate with all his kind in the peaceful enrichment of his Earth and of the people who live on it.

A general view (above) and details of "The Citizens of Calais" by Auguste Rodin, who made two originals, one for Calais and the other for London, and authorized seven originals to be cast in bronze. These are now on view in Tokyo, Philadelphia, Basle, Copenhagen, Belgium, in an American private collection and in the Musée Rodin in Paris.

RODIN AND T

by Rainer Maria Rilke

In 1347 six burghers of Calais volunteered to give their lives to save their beseiged city, and though they were eventually spared, the event has gone down as one of the most glorious examples of the spirit of self-sacrifice in history. Five hundred years later, in 1895, Auguste Rodin chose the theme for one of his greatest works in bronze, and in 1903 the poet Rainer Maria Rilke wrote a moving description of this immortal scene. Rilke's text and the group scene above are reproduced in the first volume, *War and Peace*, of a new art series entitled *Man Through His Art* appearing early next year (see page 11). The Unesco Courier presents the Rodin and Rilke works in this issue not only for their intrinsic beauty but as an example of the struggle for Human Rights to mark the 14th anniversary this month (December 10) of the adoption of the Universal Declaration of Human Rights by the U.N. General Assembly.

Photos © Dominique Lajoux

THE CITIZENS OF CALAIS

The most supreme instance of Rodin's power of exalting a past event to the height of the imperishable, whenever historical subjects or forms demand to live again in his art, is found perhaps in "The Citizens of Calais".

The suggestion for this group was taken from a few passages in the chronicles of Froissart that tell the story of the City of Calais at the time it was besieged by the English king, Edward the Third. The king, not willing to withdraw from the city, then on the verge of starvation, ultimately consents to release it if six of its noble citizens deliver themselves into his hands "that he may do with them according to his will." He demands that they leave the city bareheaded, clad only in their shirts, with a rope about their necks and the keys of the citadel in their hands.

The chronicler describes the scene in the city. He relates how the burgomaster, Messire Jean de Vienne, orders the bells to be rung and the citizens to assemble in the market-place. They hear the final message and wait in expectation and in silence. Then heroes rise among them, the chosen ones, who feel the call to die.

The wailing and weeping of the multitude rises from the words of the chronicler, who seems to be touched for the moment and to write with a trembling pen. But he composes himself once more and mentions four of the heroes by name; two of the names he forgets. He says that one man was the wealthiest citizen of the city and that another possessed authority and wealth and "had two beautiful maidens for daughters"; of the third he only knows that he was rich in possessions and heritage, and of the fourth that he was the brother of the third.

He reports that they removed all their clothing save their shirts, that they tied ropes about their necks and thus departed with the keys of the city and of the citadel. He tells how they came to the King's camp and of how harshly the King received them and how the executioner stood beside them when the King, at the request of the Queen, gave them back their lives. "He listened to his wife", says Froissart, "because she was very pregnant". The chronicler does not continue further.

For Rodin this was sufficient material. He felt immediately that there was a moment in this story when something portentous took place, something independent of time and place, something simple, something great. He concentrated all his attention upon the moment of the departure. He saw how the men started on their way, he felt how through each one of them pulsated once more his entire past life, he realized how each one stood there prepared to give that life for the sake of the old city.

Six men rose before him, of whom no two were alike, only two brothers were among them between whom there was, possibly a certain similarity. But each of them had resolved to live his last hour in his own way, to celebrate it with his soul and to suffer for it with his body, which clung to life.

Rodin then no longer saw the forms of these men. Gestures rose before him, gestures of renunciation, of farewell, of resignation. Gestures over gestures. He gathered them together and gave them form. They thronged about him out of the fullness of his knowledge, a hundred heroes rose in his memory and demanded to

CONT'D ON NEXT PAGE

be sacrificed. And he concentrated this hundred into six. He modelled them each by himself in heroic size to represent the greatness of their resolution, modelled them nude in the appeal of their shivering bodies.

He created the old man with loose-jointed hanging arms and heavy dragging step, and gave him the worn-out walk of old men and an expression of weariness that flows over his face into the beard.

He created the man that carries the key, the man who would have lived for many years to come, but whose life is condensed into this sudden last hour which he can hardly bear. His lips are tightly pressed together, his hands bite into the key. There is fire in his strength and it burns in his defiant bearing.

He created the man who holds his bent head with both hands to compose himself, to be once more alone.

He created the two brothers, one of whom looks backward while the other bends his head with a movement of resolution and submission as though he offered it to the executioner.

He created the man with the vague gesture whom Gustave Geffroy has called "Le Passant". The man moves forward, but he turns back once more, not to the city, not to those who are weeping, and not to those who go with him: he turns back to himself His right arm is raised, bent, vacillating. His hands open in the air as though to let something go, as one gives freedom to a bird.

This gesture is symbolic of a departure from all uncertainly, from a happiness that has not yet been, from a grief that will now wait in vain, from men who live somewhere and whom he might have met sometime, from all possibilities of tomorrow and the day after tomorrow; and from Death which he had thought far distant, that he had imagined would come mildly and softly and at the end of a long, long time.

This figure, if placed by itself in a dim, old garden, would be a monument for all who have died young.

THUS Rodin has made each of these men live again the last concentrated moment of life. Each figure is majestic in its simple greatness. They bring to mind Donatello and, perhaps, Claux Sluter and his prophets in the Chartreuse of Dijon.

It seems at first as though Rodin had done nothing more than gather them together. He has given them the same attire, the shirt and the rope, and has placed them together in two rows: the three that are in the first row are about to start forward, the other three turn to the right and follow behind. The place that was decided upon for the erection of the monument was the market-place of Calais, the same spot from which the tragic procession had formerly started. There the silent group was to stand, raised by a low step above the common life of the market-place as though the fearful departure were always pending.

The City of Calais refused to accept a low pedestal because it was contrary to custom. Rodin then suggested that a square tower, two storeys high and with simply-cut walls, be built near the ocean and there the six citizens should be placed, surrounded by the solitude of the wind and the sky. This plan, as might have been expected, was declined, although it was in harmony with the character of the work.

If the trial had been made, there would have been an incomparable opportunity for observing the unity of the group, which, although it consisted of single figures, held closely together as a whole. The figures do not touch one another, but stand side by side like the last trees of a hewn-down forest united only by the surrounding atmosphere.

From every point of view the gestures stand out clear and great from the dashing waves of the contours; they rise and fall back into the mass of stone like flags that are furled. The entire impression of this group is precise and clear. Like all of Rodin's compositions, this one, too, appears to be a pulsating world enclosed within its own boundaries.

Besides the points of actual contact there is a kind

Archæological Survey of India

'Love & Marriage'

of contact produced by the surrounding atmosphere which diminishes, influences and changes the character of the group. Contact may exist between objects far distant from one another, like the conflux of forms such as one sees sometimes in masses of clouds, where the interjacent air is no separating abyss, but rather a transition, a softly-graduated conjunction.

To Rodin the participation of the atmosphere in the composition has always been of greatest importance. He has adapted all his figures, surface after surface, to their particular space and environment; this gives them the greatness and independence, the marvellous completeness and life which distinguishes them from other works.

When interpreting nature he found, as he intensified an expression, that, at the same time, he enhanced the relationship of the atmosphere to his work to such a degree that the surrounding air seemed to give more life, more passion, as it were, to the embraced surfaces.

When Rodin concentrates the surfaces of his works into culminating points, when he uplifts to greater height the exalted or gives more depth to a cavity he creates an effect like that which atmosphere produces on monuments that have been exposed to it for centuries. The atmosphere has traced deeper lines upon these monuments, has shadowed them with veils of dust, has seasoned them with rain and frost, with sun and storm, and has thus endowed them with endurance so that they may remain imperishable through many slowly-passing dusks and dawns.

The effect of atmosphere, which is the monumental principle of Rodin's art, is wonderfully achieved in "The Citizens of Calais." These sculptural forms seen from a distance are not only rounded by the immediate atmosphere, but by the whole sky; they catch on their surfaces as with a mirror its moving distances so that a great gesture seems to live and to force space to participate in its movement.

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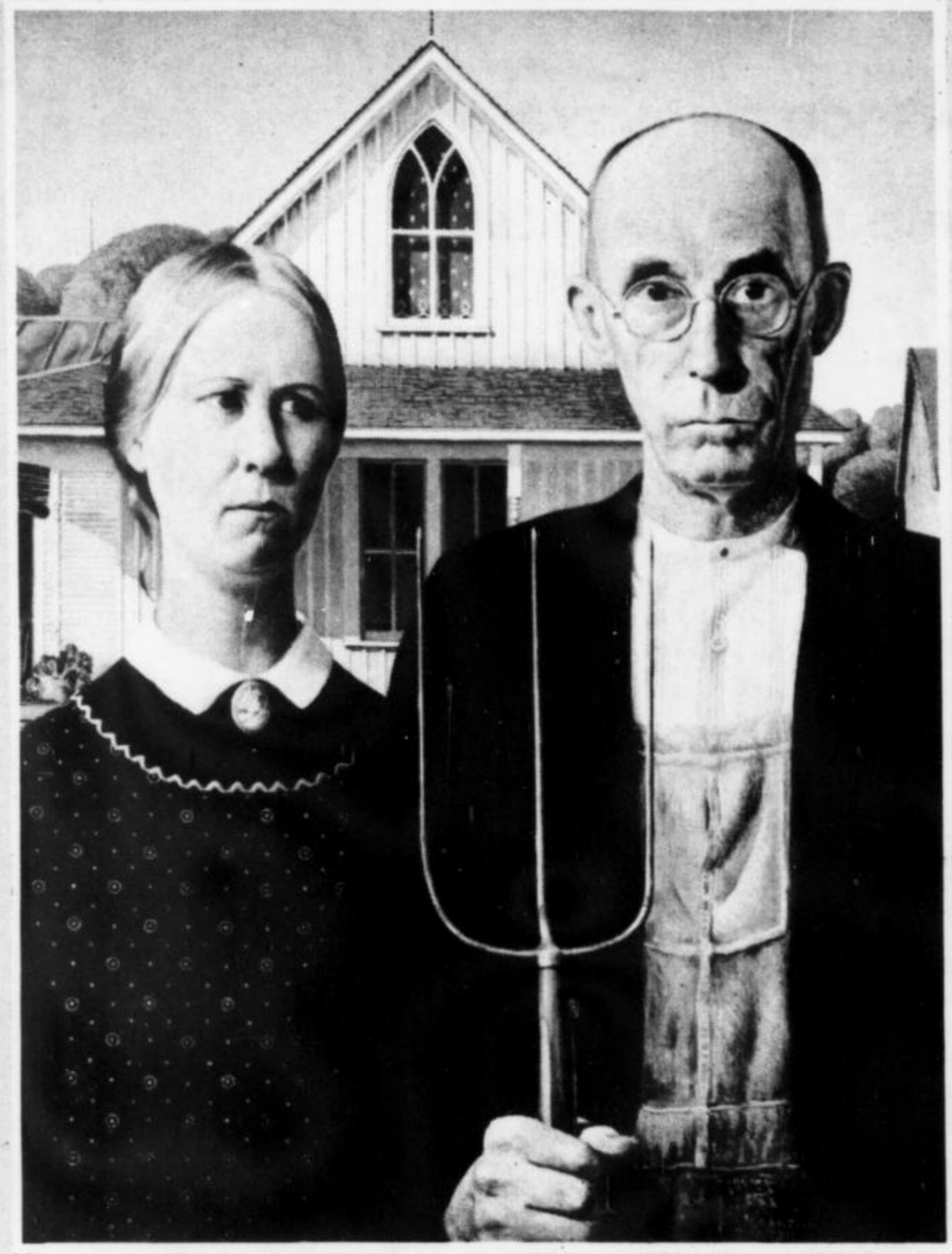

Courtesy of The Art Institute of Chicago, Friends of American Art Collection

Three great works of art in the volume "Love and Marriage", one of a series of 14 art portfolios to be published under the title "Man Through His Art". From left to right : Standing couple on the façade of Caitya Hall, Karle, Bombay (Ist century B.C.); Wedding portrait of Giovanni Arnolfini by Jan Van Eyck (1434); American Gothic, a painting by Grant Wood (1930).

'MAN THROUGH HIS ART'

THROUGHOUT the ages, from the time he dwelt in caves to the present day, man has been impelled to an artistic expression and across the long tapestry of his history he discloses in his art the same inspirations prompting his painter's brush or sculptor's chisel.

The great themes of his art admit no frontiers; they vanquish both time and conflict, providing a perfect basis for the introduction of one culture to another.

On this basis a series of art portfolios called "Man Through his Art" is being prepared by an international group of scholars and art historians working within the framework of Unesco's Major Project for the Mutual Understanding of Eastern and Western Cultural Values.

"Man Through his Art" is sponsored by the World Confederation of Organizations of the Teaching Profession (W.C.O.T.P.) and will be published with the collaboration and financial aid of Unesco. It has received a research grant from the Rockefeller and other foundations in the United States, and many of Unesco's national commissions—those of India, U.S.A., Sweden, Federal Republic of Germany, Cambodia, Spain, Ghana and the United Kingdom—have also co-operated to make the project possible.

The complete series will appear over a seven-year period in 14 folios on 14 separate themes: War and Peace, Music, Nature, Man at Work, the Human Face, Festivals, the Vision of Bliss, Love and Marriage, Charity, Death, Man and Beast, the Family, Dreams and Fantasy, and the Experience of God.

The first two portfolios, War and Peace, and Music, are scheduled to be published early in 1963. The immense theme of war and peace ranges from works of art from the modern period to 3,500 B.C. Saharan rock paintings (the Archers of Tassili) through the heroic epics of ancient India and Greece (the Mahabarata and Homer's Iliad), and the Chinese Buddhist cave painting "Meditation before the Setting Sun" expressing visually the Chinese saying that "Peace comes through a man's ability to listen not only with the ear but with the mind, not only with the mind but with the spirit."

Each portfolio will have 20 reproduction plates (12 1/4" by 9",) 16 in full colour and 4 in black and white. The plates will be detachable for display in classrooms, adult education and community centres, and a text prepared by eminent scholars will combine information about the approach of different cultures to each theme with a detailed analysis of each work of art chosen.

The volumes seek to reveal to the modern student not only the multiformity of the world's civilizations and the inter-relationship of their artistic expression but man's fundamental similarity of response within them.

Within the shrinking bounds of our world today we live in the immediate presence of other civilizations and our understanding of them has become indispensable to the discovery of our own identity. The editors of the "Man Through His Art" series hope that the recurring themes of man's creative history will bridge past and present and link the people of the world in better understanding.

★

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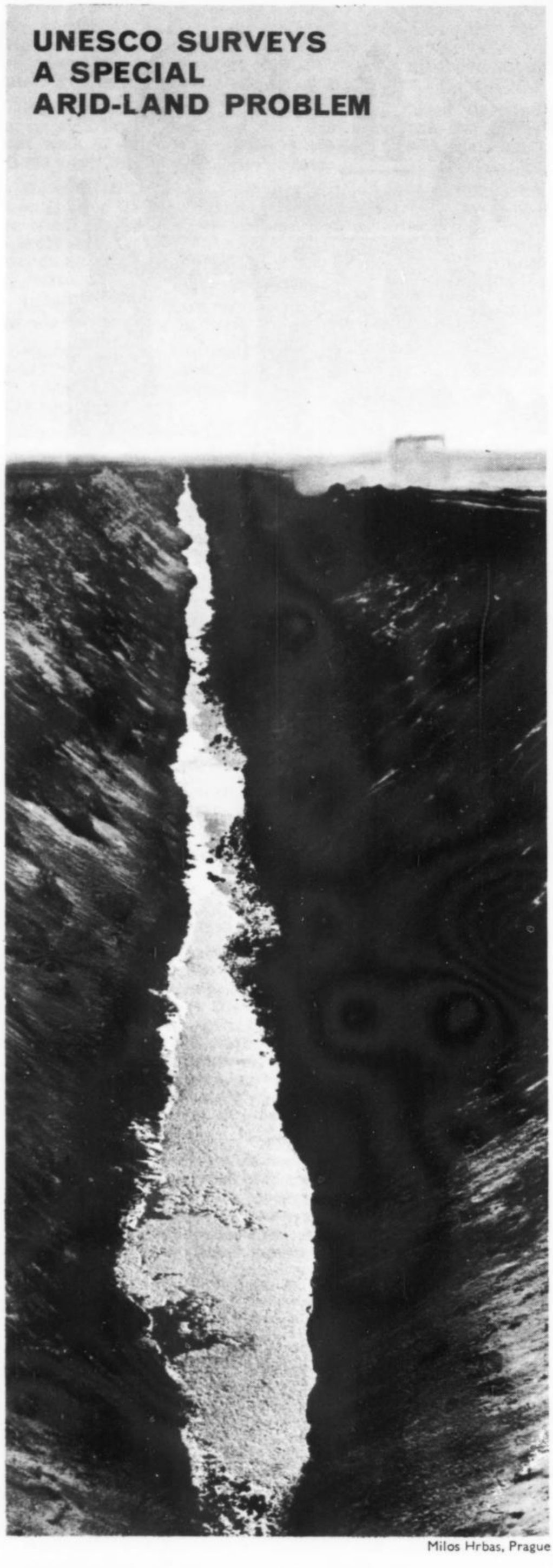


Milos Hrbas, Prague

12 From as far as the eye can see a silver ribbon of water flows down a newly excavated drainage canal in the Soviet Socialist Republic of Uzbekistan.

Y. Bagrianski, U.S.S.R.

THE DEADLY

TASHKENT is one of those names on the map that ring with adventure. Long before clumsy galleons set out for new worlds, it throbbed with life along the main artery of trade between East and West. It was one of the great caravan halting places of Central Asia on the silk route from China to Europe. Here, travellers halted on their journeys, exchanged their goods and their ideas and, perhaps, learned that what they had in common outweighed what set them apart.

Recently, I watched Tashkent live through another such adventure. The setting was a modern, rambling city of 1,000,000, the capital of the Uzbekistan Socialist Republic in the Soviet Union. The camel caravans had been replaced by jet airliners and plodding donkeys had given way to trams and trolleybuses, but that atmosphere of the caravanserai as an international meeting-ground could still be felt.

This time, the travelers were scientists and the treasures they were exchanging were knowledge. From twenty-five countries, 300 of them had come to Tashkent to take stock of a little-known problem that is one of most dangerous enemies facing man in his struggle to wrest new land from desert and semi-desert regions the world over.

A burst of water from a high-pressure hose being operated in the Uzbekistan desert and a sand dune disintegrates and is washed away.

SALT OF THE EARTH

by
Daniel Behrman

They met in a symposium on the influence of irrigation upon secondary-salinization of soils, organized by the Academies of Science of the Soviet Union and Uzbekistan with the co-operation of UNESCO.

In addition to this symposium, Tashkent also played host to a group of twelve UNESCO fellows studying problems of irrigation and salinization under differing conditions. Their course in the Soviet Union followed stays in the United States and France.

Why this concern with salinization? To the non-specialist, with whom I had a great deal in common until the problem was patiently explained to me, saline waters belong in the sea and the "fight against salinization" implies efforts to convert the oceans into reservoirs of unlimited supplies of water for drinking, industrial and agricultural purposes.

The Tashkent symposium, however, was interested only in saline soils and saline ground water. True, this water is not very salty—when used for irrigation, it contains only from 0.5 to 2 grammes of minerai salts per litre (1,000 grammes) as compared to an average of 35 grammes per litre in the sea. But if it is not handled carefully, it can play havoc.

The extent of this havoc was quickly brought out at the Tashkent meeting. It opened with a statement by Prof. G. A. Mavlianov, the director of the Uzbekistan Institute of Hydro-Geology, in which he estimated that 30 per cent of the 12,000,000 hectares now irrigated in the Soviet Union are salinized to the point where they require reclamation to some extent. Dr. Luna Leopold, chief hydraulic engineer for the United States Geological Survey, put it to me in another way: in the U.S.A. to-day, every new acre of land brought in by irrigation is offset by the loss of another acre rendered partially barren by secondary-salinization. This figure, he believes, holds true for arid zones thoughout the world.

Now the meaning of the Tashkent symposium was beginning to be driven home: in these arid lands where every acre of new soil represents both a huge economic investment and a marshalling of engineering and scientific skills, modern man is literally sowing his fields with salt.

Yields drop, plants wilt, whitish slime oozes into

CONT'D ON NEXT PAGE

THE DYING GROUND

White patches covering ground between date palms (left) are salt deposits brought to the surface by evaporation of moisture from water-logged soil at Lahore, Pakistan. Salts poison the soil, stunting nearby vegetation. Soil specialists (right) doing research work in Uzbekistan are almost hidden by dust clouds swept up by the searching wind from the eroded ground.

West Pakistan Water and Power Development Authority, Lahore.

SALT OF THE EARTH *(Cont'd)*

Lands poisoned by man

furrows to turn land into a waterlogged salty mass, grey outcroppings of salt blotch the surface in pools—even walls and foundations of buildings are attacked by a man-made curse of the earth.

The blight ignores political boundaries. As speaker after speaker took the rostrum in Tashkent, I learned that it strikes in the Central Valley of California, the cotton-fields of Uzbekistan, the Valley of the Euphrates in Iraq, the Polygon of Drought in northeastern Brazil, the Indus Plain in Pakistan... Temperate zones cannot afford to relax fully, either: the danger lurks whenever irrigation is used to supplement scanty rainfall.

A question flashed into my mind as I listened to this toll: what about the ancients? How were they able to irrigate for centuries or even millenia without suffering from salinization? This question came naturally after Dr. Mustafa M. Elgabaly, director of the Land Reclamation Institute of the University of Alexandria in the U.A.R., told how salinization has appeared in Egyptian soil only within the past century after 5,000 years of irrigation.

Here, I had unwittingly found the crux of the problem. Ancient civilizations learned from trial-and-error to irrigate with water of low salt content on soils with good natural drainage. Even so, it is believed that salinization was one of the causes for the decline of the great ancient civilization of Mesopotomia. In some cases in history a set of fortunate circumstances enabled irrigation to be carried out without excessive dangers of salinization. For instance, around oases, where land was irrigated for thousands of years, belts of salt-resistant date palms provided biological drainage by drawing the salt from the soil.

Modern man, however, cannot rely on such exceptional conditions when he seeks to stretch the cultivable surface of the earth. He must run the risk of using water with a high mineral salt content when no other new supplies are available. He must cultivate land where nature has not provided the soil with drainage.

That is where the trouble begins. The two main causes of secondary-salinization (scientists use this term to distinguish man-made salinization from the problem of naturally saline soils) are too little water... and too much water.

Modern irrigation systems tend to stretch their water supplies over the largest possible area of land. In dry years when water resources drop, there is not enough left for leaching—that is, for flushing salts out of the upper layers of the soil where they accumulate when evaporation removes water from the earth—but not its salts. The leaching process is extremely important: it is also used in making naturally saline soils fit for cultivation.

Too much water can be even worse. It may come from over-irrigation when farmers prefer the prospect of high short-term yields to the long-term warnings of scientists. It also is caused by seepage from unlined irrigation canals (losses of water in transport can run as much as 50 per cent in old systems).

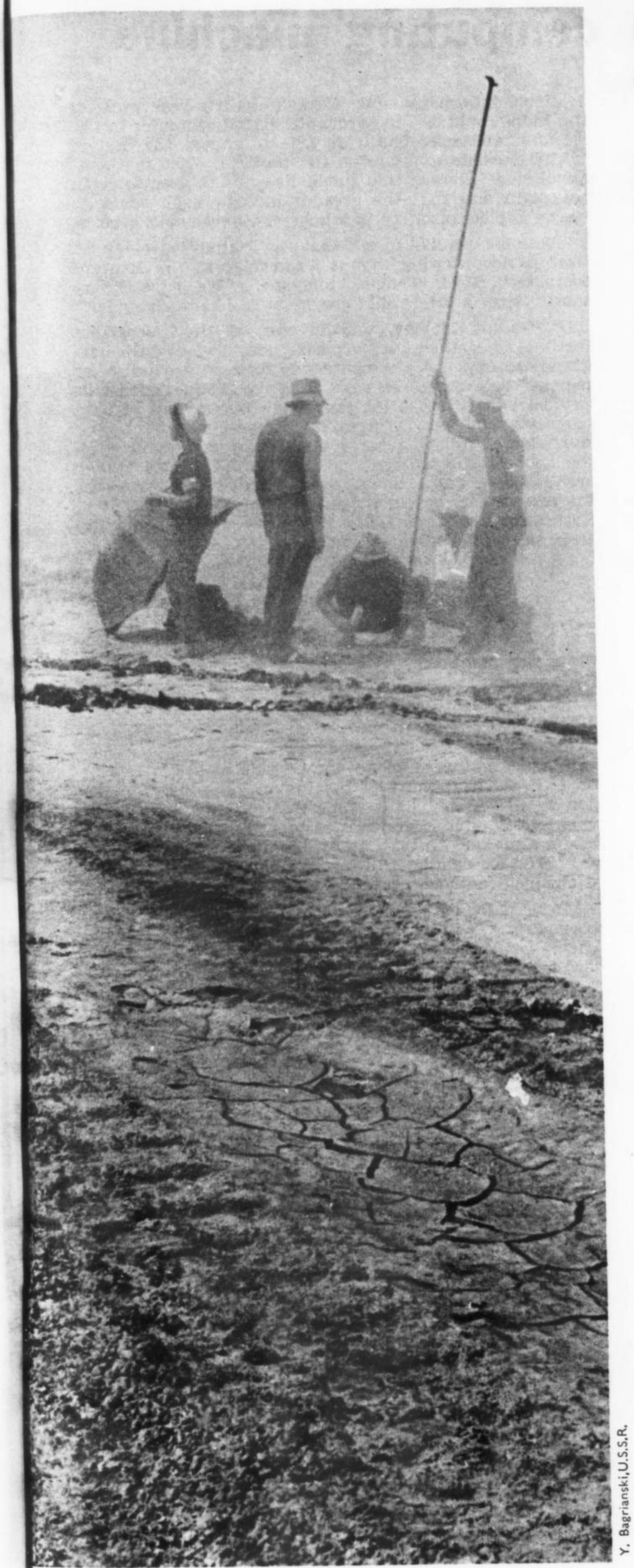
THE combination of the two raises the subsurface water table at a rate often as high as three feet a year. When this ground water table rises to the point where roots can suck it up through capillary action, plants commit slow suicide and rich land becomes a soggy swamp.

Like the common mortal who is neither a soil scientist nor a hydrogeologist, I had always thought that making arid land productive was simply a matter of bringing water in. But the Tashkent symposium was much more interested in getting water out.

It would be an exaggeration to say that, after four days of meetings and seventy-five scientific papers, the problem of salinization was solved. We have been spoiled by the miracles of modern science in which a wonder drug can wipe out a pestilential disease overnight or a discovery in petrochemistry can revolutionize the objects in our everyday lives. But soil, water and agriculture do not lend themselves to such dramatic test-tube treatment. The conditions under which scientists must work here are as varied as the waters and the soils of the earth itself.

The Tashkent meeting made one point clear: this is not one of those problems where wastage of natural resources is an inevitable consequence of progress. On two different occasions, I heard an American and a Soviet scientist state flatly that irrigation per se is not the culprit. When properly performed, it can reclaim waste land. The fight against salinization is a delicate and complex process: it might be compared to adding and draining exactly the right amount of water, according to its qualities, while tending a flowerpot—except that the flowerpot in question usually measures a few hundred thousand acres.

This flowerpot analogy was underlined when Prof. Pierre Chouard of the Sorbonne, director of the phytotron outside Paris where plants are studied under artificial environments, told of a fascinating small-scale experiment in the Sahara. There, fruit and vegetables are grown in



Y. Bagrianski, U.S.S.R.

In the shadow of Tamerlane's tomb

large plastic containers filled with sand and equipped with "plumbing" to assure drainage of highly-saline water. While this method is suitable only for desert stations where its high cost is still lower than the price of bringing in food by road or air, it came as a welcome interlude among reports of gigantic drainage projects.

Throughout the world, the scale of these projects is nearly as great as that of irrigation dams and canals. In certain regions, porous tile drainpipes are laid by automatic machinery at depths from ten to fifteen feet below the earth's surface and they carry excess water into collector canals in a network comparable to that of a city's sewage system. Elsewhere, tube wells may have to be drilled to depths as great as 300 feet (100 metres) to pump out this excess water and lower the subsurface water table out of the range of plant roots.

But how much land can be drained by a given number of tube wells or a given length of horizontal drains? Which plants resist salinity best? At what point according to the mineral salt content of irrigation water should preventative steps be taken? And how can crops be irrigated so as to maintain high yields, conserve water and prevent re-salinization all at the same time?

THESE were some of the questions asked and often answered at Tashkent both in and out of the symposium. As any scientist who has ever attended such an international meeting can tell you some of the most valuable work of a symposium is done outside official working hours. Tashkent itself was fertile soil for such encounters.

Despite its industrial growth represented by textile factories feeding on irrigated cotton fields almost at its gates, it has wisely clung to its character of an oasis city. Every street and avenue is lined by shady trees whose roots bathe in omnipresent irrigation canals, a minor pedestrian hazard until you get used to them. With its squares, parks and fountains, present-day Tashkent is still on a human scale propituous for walking and talking. Over shashlik or pilaf in a restaurant, drainage could be discussed. On the balcony of a hotel room in the cool desert night, an equation could be thrashed out. We even saw people of four nationalities working in the shadow of Tamerlane's tomb during a trip to Samarkand.

Men and women who had been faces behind printed namecards became real with the help of generous Uzbek hospitality. The mixtures with the experiences of two dozen countries as its ingredients, began to bubble.

A very wise gentlemen, Prof. Alexei Silin-Bekchurin, told me: "I think that the outstanding feature of our symposium is that it is being held in the desert where irrigation and its problems are a reality."

They were able to contribute three decades and more of experience in Central Asia to the symposium. One such veteran at Tashkent was Dr. Boris (Dimetreyevitch) Korjavin, director of irrigation and reclamation planning for Central Asia. This canal builder is a weathered oak of a man with a gleaming, smooth-shaven head rooted to a powerful neck, and a face seamed by a ready smile. He could tell of changes: when he came to Tashkent in 1925, occasional camel caravans still passed through the city.

"Irrigation was easier then, too", he said almost wistfully. "We still had plenty of good land without any salinization problems."

In those days, the problem was machinery. Canals were dug by hand and Dr. Korjavin recalled how the Great Fer-

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The Indus river in a computing machine

ghana Canal of Uzbekistan was opened in 1939 in a fantastic pick-and-shovel Olympic: 160,000 men dug 320 kilometres of canal in 45 days, moving 18,000,000 cubic metres of earth. "Two years ago", he commented, "we had to widen the canal to double its capacity. We didn't move a single cubic metre of earth by hand."

WOMEN have had a hand in this work as well. Soviet women scientists can be startling—at least, I was startled when I learned that a quiet lady in a cool print suit and a summer hat had spent fifteen years of her life trekking through the deserts of Turkmenistan, Uzbekistan and Kazakhstan. Prof. Helene Lobova of the Soil Institute in Moscow crossed them first by horse and then by car.

"I chose the career of soil scientist because I wanted to visit the Orient", she admitted. "But I quickly found that this science is bound up with the relation between man and nature. The nature of the soil can explain many things in the life of a people and scientists can often learn from the people of the desert. Farmers in Central Asia have always used sand from old walls to improve the texture of takyr—the clay-like mosaic soil found in some of our deserts. Today, we know that the only way to change the texture of this soil is to add sand to it, but on a much larger scale."

Conditions have changed for scientists in Central Asia. When Dr. Vladimir (Mikhailovitch) Borovsky came to Khazakhstan in 1934, soil samples still had to be sent to Moscow or Leningrad for analysis, but he is now vice-director of the Soil Institute of Khazakhstan at Alma Ata where 250 scientific collaborators are working with him. His home was originally in Leningrad, "the best town in the whole country and not just because it's my town" yet his life to-day in Alma Ata is a full one composed of work, music, walking for relaxation (20 miles on a Sunday) and scientific writing.

He is a warm, stocky man with blue eyes, grey hair, a gentle manner and that purely Russian gift for smiling broadly while smoking a cigarette (that is, while clenching the cardboard tube of a *papyroska* between his teeth). Over a glass of tangerine soda at a little oasis of a stand outside the symposium, he told me that he believed in world co-operation by scientists to fight what he called "a war on salinization." In this respect, he has high hopes for an international manual on irrigation and drainage sponsored by UNESCO and the U.N. Food and Agriculture Organization. "People all over the world are working on this problem," he said. "This manual will enable us to learn their ideas and contribute our own."

SUCH an exchange took place at the scientific caravanserai of the symposium, particularly with the help of mathematics as an international tongue to topple hurdles of language and nationality. In this respect, extreme interest was stirred by Prof. Harold A. Thomas Jr. of Harvard University when he described the use of a digital computer to study the feasibility of using tubewells to drain the waterlogged Indus Plain in West Pakistan.

Prof. Thomas is a slight, bespectacled man of fifty with a boyish aspect that belies his age. He was almost dwarfed by the rostrum as he reported on a United States project to aid Pakistan in combatting widespread salinization afflicting this region.

In this project, a mathematical model of the Indus Plain was constructed at Harvard University, incorporating such data as river flow, rainfall, drainage, ground water flow as well as economic factors on the basis of available information. As a result, a fifty-year cycle of the Indus could be run through a digital computer in two minutes, and scientists were able to choose the best of 100,000 possible solutions to the problem. The mathematical model showed that tubewells could be used to drain the plain and that the area drained by each could be nearly tripled, resulting in a huge cut in reclamation costs.

"At home, we like to say that the Punjab's five-fanged river is now flowing dry at Cambridge in the Harvard computer", Prof. Thomas told me. "We expect very shortly that a river will flow in a Tashkent computer."

Dr. Vassil Kabulov, vice-director of the Uzbekistan Institute of Mathematics, reported that Soviet mathematicians are now using computers to forecast ground water regimes, to estimate seepage from reservoirs and canals and solve other irrigation problems. He was one of fifty scientists who met with Prof. Thomas in an informal shirt-sleeved working party on computers organized on the spur of the moment. There, Prof. Thomas turned over his data and received more—he now intends to use the research on cotton irrigation carried out by Dr. S.N. Ryzhov of Tashkent State University as an additional element in his computer studies.

GIVE-AND-TAKE ran through this entire symposium like a bright thread, representing what Prof. N.A. Kenessarin, vice-director of the Institute of Hydrogeology of the Uzbekistan Academy of Science, called the "eagerness" of all nations to advance research for the benefit of arid lands.

On and off the symposium floor, the channels of communication were open. Dr. Leopold was able to help Dr. S. P. Raychaudhuri, of the Indian Planning Commission in New Delhi, on a common problem: what to do when silted river channels rise to the point where they hinder drainage. In turn, at Tashkent the Indian scientist was asked for details of his own studies on the movement of chemical nutrients from rocks through clay to plants.

The need for such channels was strikingly brought out when Prof. Abdul Rassool Kamaliddin, director of the Arid Zone Research Institute at the University of Baghdad, met Dr. V. R. Volobuev of the Azerbaijan Institute of Soil Science and Agricultural Chemistry. They learned that, working separately in Iraq and the Soviet Union, they had arrived at almost the same equation to govern the flushing out of mineral salts from the soil.

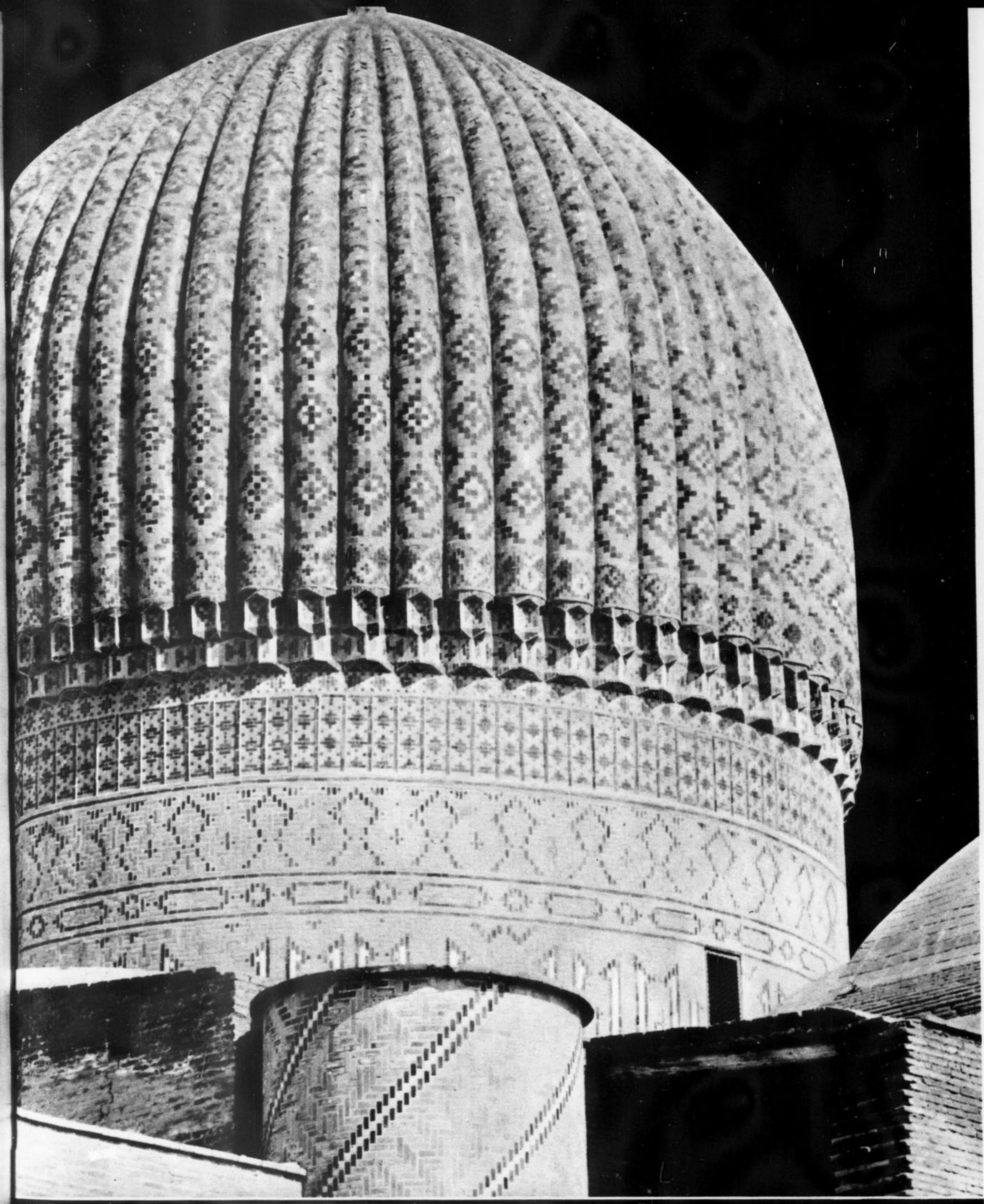
This free interchange was stressed at the close of the symposium by Dr. Victor A. Kovda, former head of the Salinity Laboratory of the Soil Institute in Moscow and now director of UNESCO's Department of Natural Sciences. It brought out, he said, that highly-salinized waters (up to 6-8 gr/l) can be safely used for irrigation purposes under conditions of active drainage.

It also brought out that the problem of forecasting and controlling de-salinization can be solved only by an integration of all methods, he declared, and the electronic computer is an invaluable tool for such an integration. But it is not a panacea.

"The use of computers", Dr. Kovda warned, "depends upon their programming and this programming requires extremely detailed knowledge of natural processes. In other words, the use of computers to solve irrigation problems means even deeper research into nature".

Then Dr. Kovda summarized the spirit of the Tashkent symposium as well as its scientific lessons when he concluded:

"We are all working with ground water, a hidden ocean beneath the surface of the earth. Our meeting has shown that this ocean links the scientists who are trying to extract its secrets."



Milos Hrbas, Prague

SAMARKAND THE FABULOUS

Capped with a bright, blue-green tiled cupola, the Gur Emir (above) is one of the most striking monuments of Samarkand, an ancient city renowned for the beauty of its 14th and 15th century architectural and decorative treasures. Tamerlane and one of his grandsons, Ulug Beg, are buried within. Tamerlane's tomb was opened for the first time in 1941 and examination of his skeleton proved that, as it had been told, he was lame.

It was to Timur (the lame Timur) commonly known as Tamerlane whose empire finally spread from northern India to Asia Minor, that Samarkand, capital of the kingdom of Transoxiana owed its legendary splendour. For Tamerlane, whose ruthless cruelty became a black legend recounted down the centuries,

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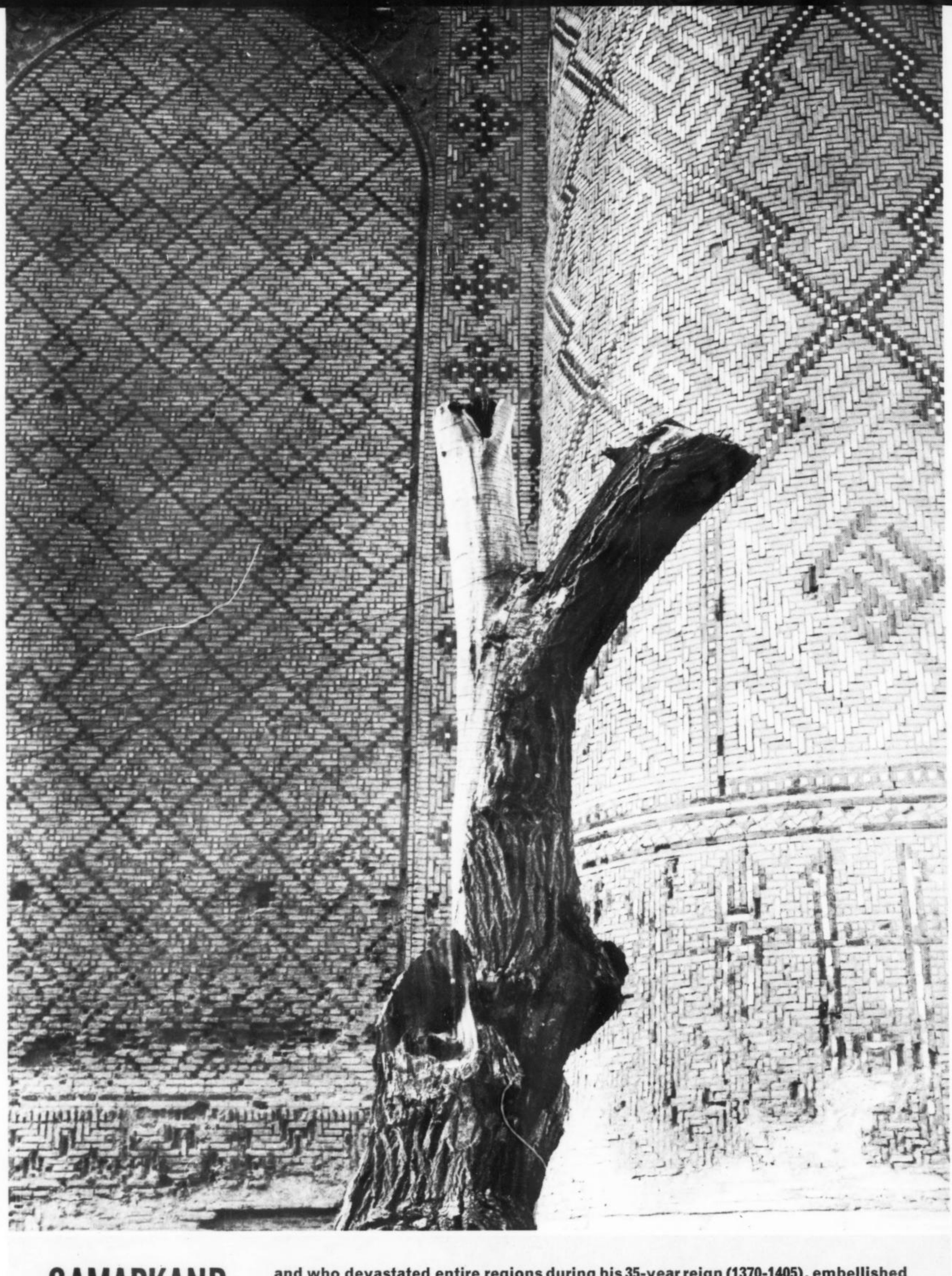


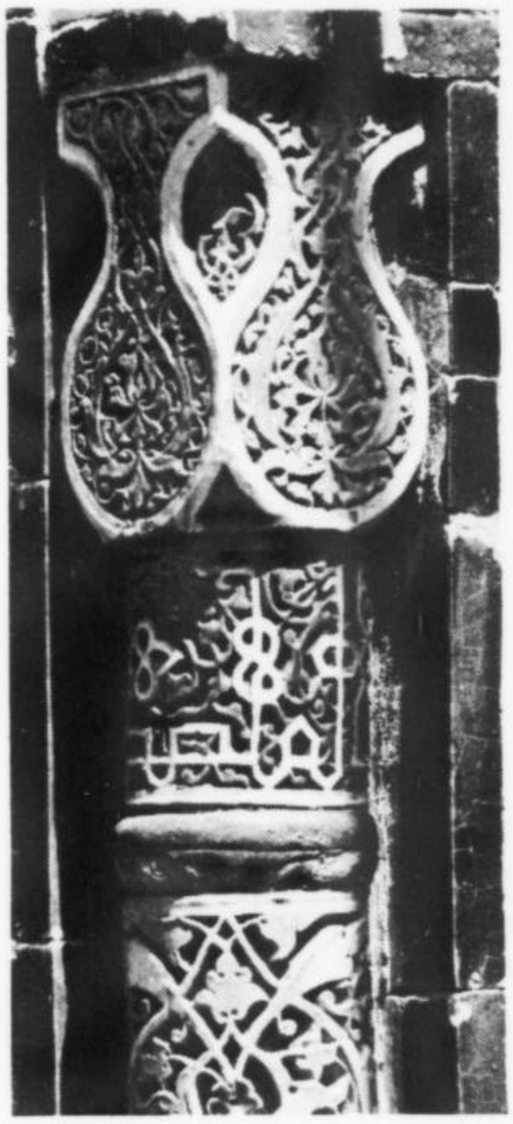
SAMARKAND

(Cont'd)

and who devastated entire regions during his 35-year reign (1370-1405), embellished his capital with care and affection.

His son, Shah Rukh and his grandson, Ulug Beg, as pacific as he himself had been warlike, in their turn made Samarkand a brilliant centre of Persian culture. It was already a very ancient city for its name first appears in accounts of Alexander the Great's expeditions. After the Islamic conquest it became a metropolis famous for its gardens, canals and fountains. It was well-known as a centre of paper-making. In 1220 A.D. it was sacked by Ghengis Khan.

Ulug Beg, a patron of science and the arts, was passionately interested in astronomy and built an observatory on a hilltop, close to his capital. His measurements of the astronomical year made in the 15th century are said to differ only by one minute from the calculations made four centuries later.



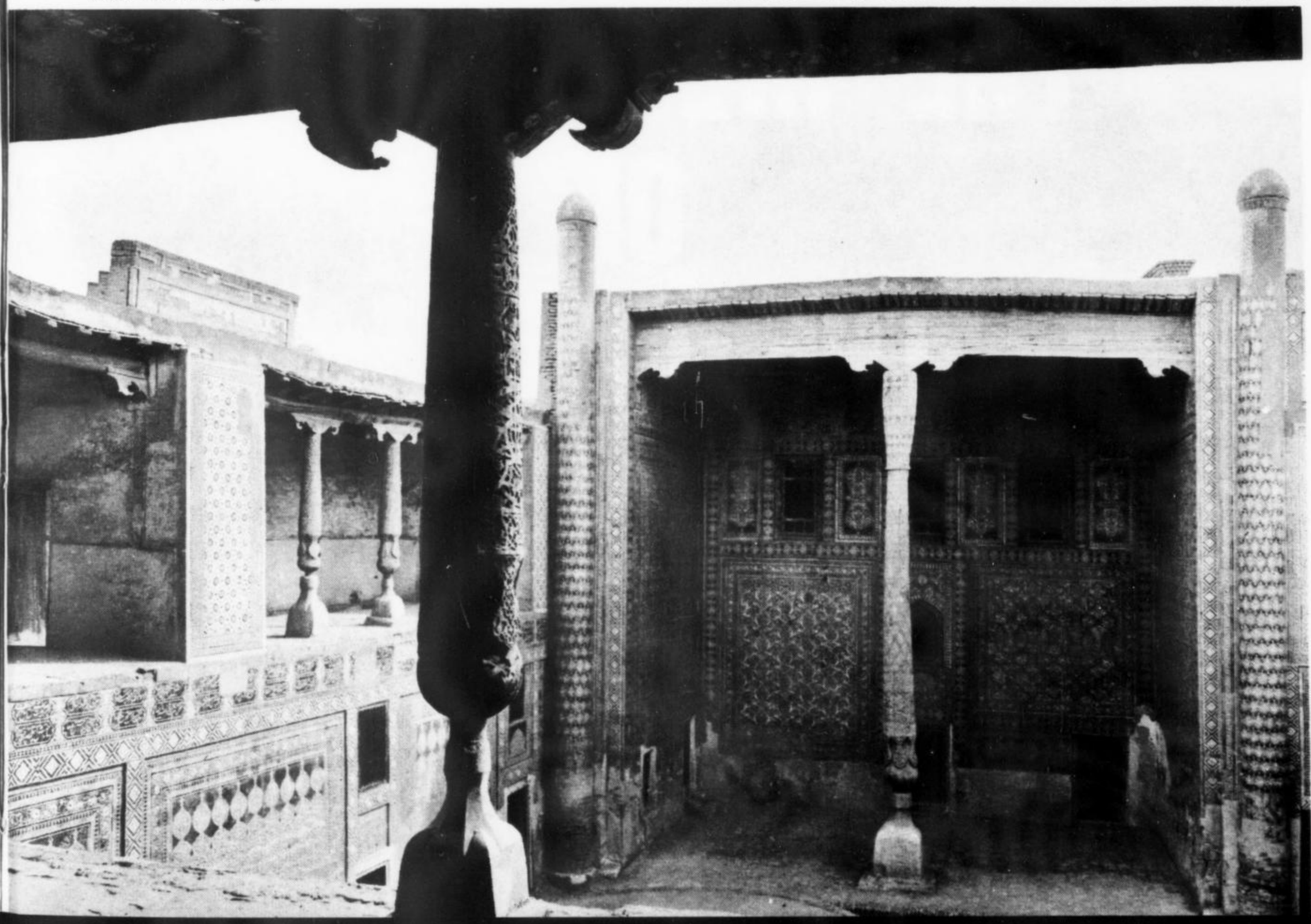
Intricately carved designs (above) decorate walls of mausoleums outside Samarkand, burial place of Tamerlane's family. Tiles are coloured yellow, lilac and turquoise.

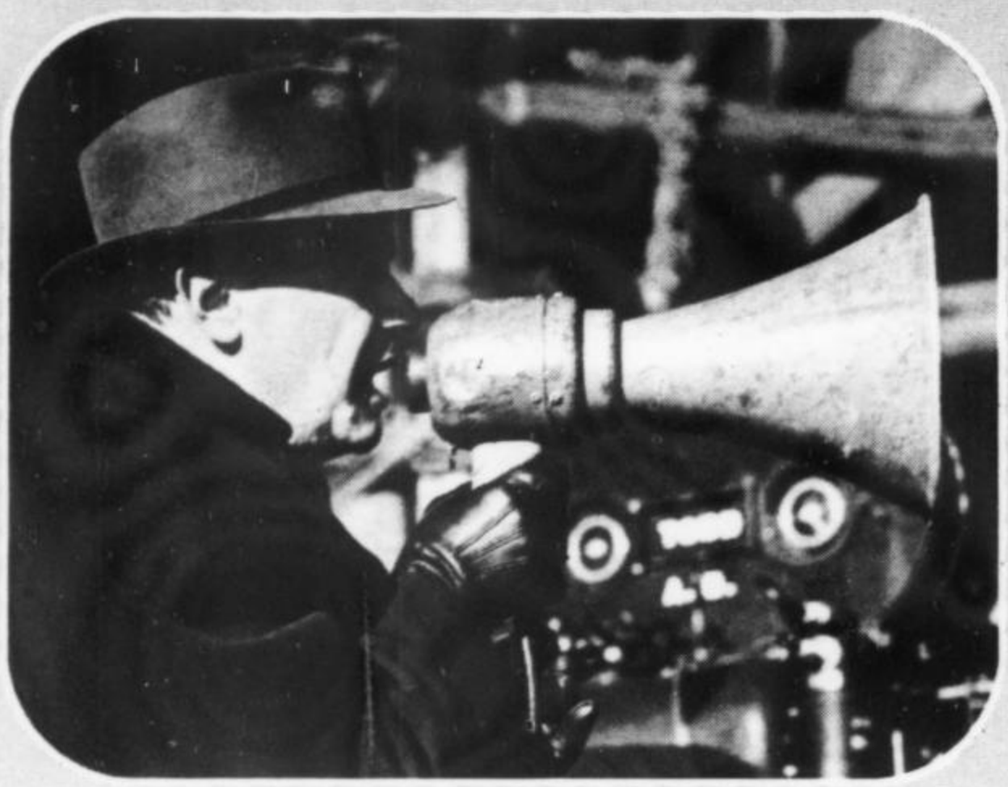
Immense tiled walls of the Babikhanim Mosque, erected in 1388 by a Chinese wife of Tamerlane, tower above the streets and colourful bustling bazaar of Samarkand.

Photos Milos Hrbas, Prague

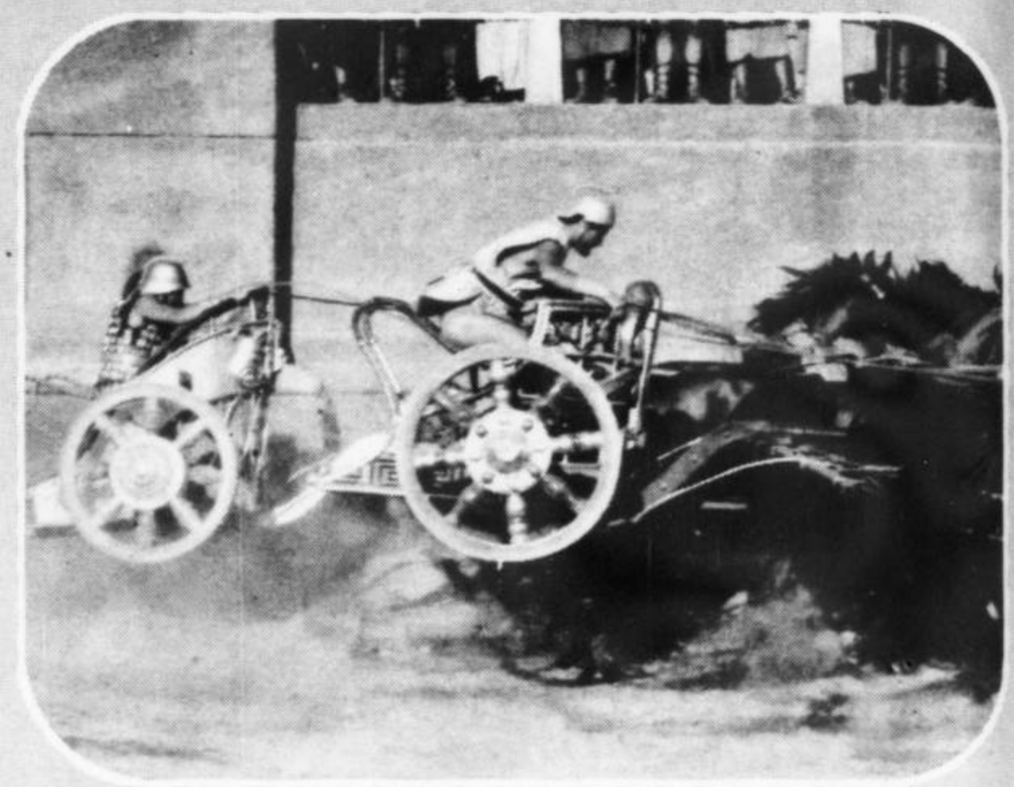
Ruined towers of Tamerlane's palace in Samarkand still testify to the city's former magnificence. After 1369, Tamerlane and his successors enlarged and beautified it.

The kingdom of Khiva once held the keys of the mighty Oxus River (Amu Darya) in Central Asia. Changes in river's course have brought desert conditions. The palace of the Khan (below) recalls its capital's ancient glories.





American director Joseph Mankiewicz. (20th Cent. Fox)



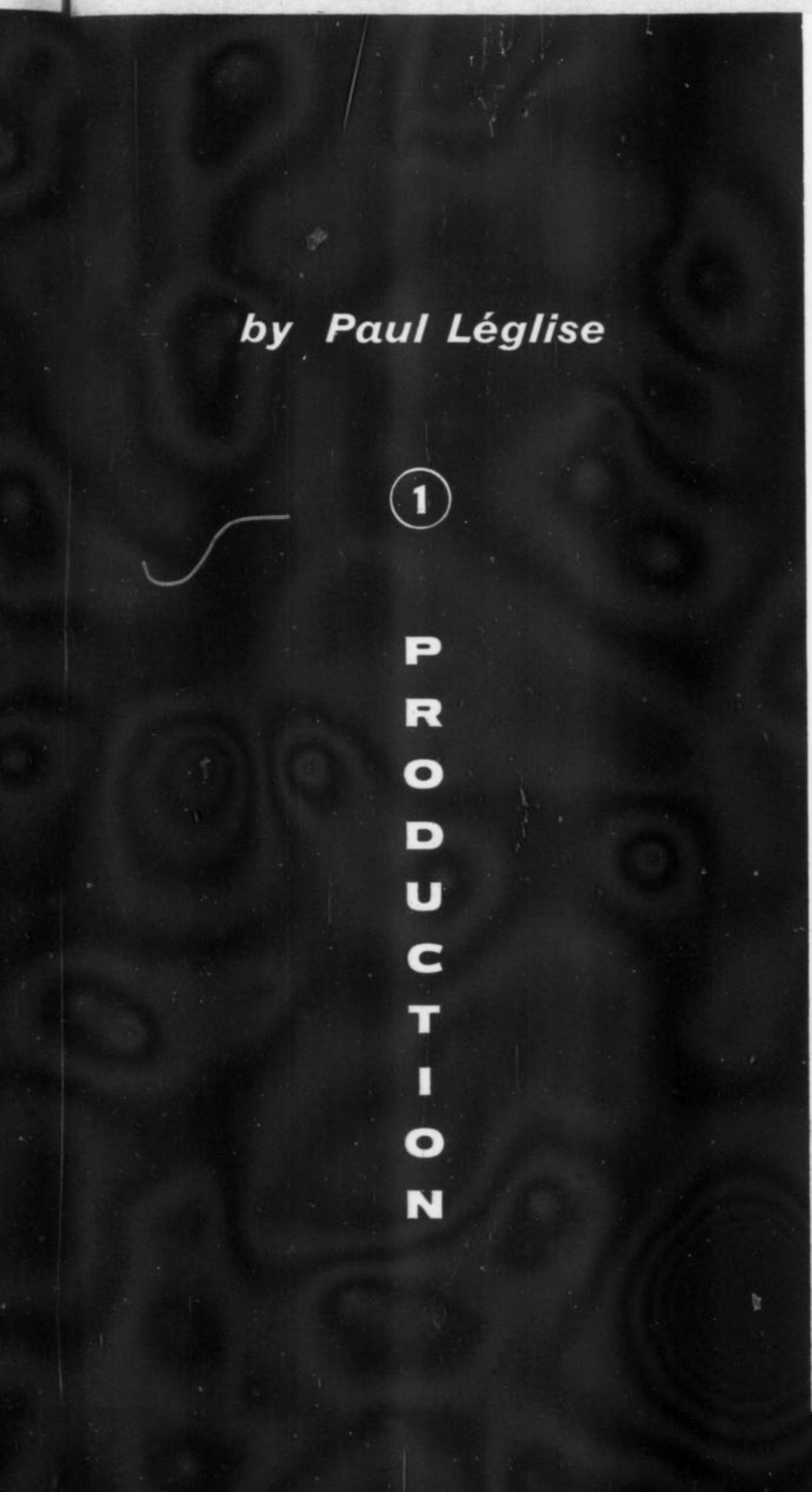
Chariot race scene from the film "Ben Hur". (MGM)

THE HIDDEN FACE OF THE CINEMA

With this issue, The Unesco Courier begins the exclusive publication of a series of articles on some of the lesser-known aspects of the cinema industry, based on a world survey undertaken by Paul Léglise. M. Léglise takes us on a voyage into the hidden problems of production, distribution and financing of feature and documentary films of all kinds, including the impact of TV on the film industry.

From the WHO film "To Your Health". (WHO photo)

Japanese actresses at Tokyo Film Festival (© Almasy)



by Paul Léglise

1

PRODUCTION

LONG queues winding down the streets outside the box office ; a mystifying or suggestive title at the entrance to draw in the crowds ; a famous star's name or photograph haloed in a blaze of lights ; a torrent of publicity pouring forth the star's daily adventures — real, embellished or imaginary. Rain or shine, the queue waits patiently to pass inside for two or three hours on an evening or a weekend. This, for the great majority of the general public, is the stereotyped façade of the cinema.

Yet behind the façade sits the cinema manager adding up his takings. He sees his customers fleeing the bustle of the city on their days off. He knows the T.V. programmes will keep other old "faithfuls" at home tonight. He is delighted of course with his Sunday week-end crowds, but the week is also made up of working days, and his empty seats cannot be seen by the passerby in the street outside. Besides, all cinemas are not located on the Champs-Elysées, in Piccadilly, near the Via Veneto or on Broadway.

Not so long ago, various pundits rose to voice alarm at the effects of the cinema and lost no time brandishing interdictions and the cutting scissors. Then along came the public finance experts who set about estimating what cinema taxes could be levied on the thousands eager for entertainment.

Fortunately the detractors of the cinema have come to a better understanding of the positive contributions the cinema can make, and now realize that a new approach is needed in order to promote the production of films specially suited for young people. This trend is also reflected in the new attitude of government finance officials who now recognize the economic and cultural importance of the cinema for their countries, and are gradually lowering the barriers raised by their predecessors against the free circulation of films. Today we find the State giving its financial help to promote the development of national film industries.

The man who is the qualified intermediary between

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The new undocile audience

the cinema and the public is the manager of the cinema theatre. Although he is only one part of the cinema world everyone in the huge industry watches the rise and fall of his box-office takings. For regardless of the form of social or economic system the cinema operates under, money remains the arbiter of film subject matter. A film must please those who finance it and who decide what they think is the public's taste. But it must also please the audience itself, the real cinema audience, that is.

Once the most docile of creatures, the cinema public is changing and is showing increasing discrimination in the type of films it is willing to accept. With the help of a new type of film critic who is both lively and hard-hitting, with the emergence of film clubs which foster a deeper understanding of the cinema as an art, the passive audience is being transformed into devotees of the film—"cinephiles". People now go to the cinema to see the work of a particular director, and actually follow the trends of different "schools" of film makers. The cinema in fact is becoming a more difficult profession to work in and thereby infinitely more exciting and rewarding.

Furthermore, the cinema is no longer confined to the public theatre. We now find it in the school, in the factory, in fairgrounds, exhibitions, hospitals, museums, and many other hitherto unsuspected places. We find it in the isolated village of the African bush, and in meetings of specialists and great scientists. It is a working and research instrument for education, science and culture where it has proved its value in every corner of the globe.

In the conception, production and distribution of a film a whole series of complicated operations are involved. Artistic values, cultural factors, economic considerations, technical principles and industrial requirements all overlap and clash. This makes the behind-the-scenes life of the cinema no less fascinating than the flurry of its outer bustle, superficial, artificial and publicity-inspired as it so often is. Besides, the one explains the other.

LET us try to penetrate behind the halo of mystery which often prevents the general public from grasping the fundamental problems of the great film industry. The film enthusiast may perhaps regret that there will be no examination here of the films of a Hitchcock, René Clair, Antonioni, Chukhrai, Satyajit Ray, Kurosawa, Norman McLaren or Jiri Trnka. But we shall not have much occasion to mention their works except to indicate their production costs or box-office takings.

Some readers may be disappointed too to find no description of the studios and the actors at work or an explanation of how the camera can express an idea or feeling.

Our purpose, however, is to demonstrate to those interested in the cinema that it is equally important to know the underlying factors that regulate the production and distribution of films. Here too the role of the cinema devotee could be as decisive as it has been up to now in moulding public taste.

Let us not forget that the economic and organizational problems confronting the cinema today bear within them the seeds of the great renewal of tomorrow and that this depends on how these problems are ultimately solved.

A Brigitte Bardot film and an industrial film on the manufacture of steel are exactly the same when we look at them in terms of the general techniques of film production. Where they differ is in the number of persons employed, the means and capital engaged, and the methods of production used.

It takes more than a camera and a few reels of film to make a film. There must first be the nucleus of a scenario, a "synopsis"; or at least an idea. Sometimes the producer buys a title. It may be the title of a popular song or the title of a book. One French producer once bought the title (and nothing more than the title) of

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MGM

SYNTHESIS OF ART AND INDUSTRY

Towering backdrops, an army of "extras", powerful arc-lights, batteries of cameras and sound recording equipment, engineers, electricians, carpenters, painters all under the command of a producer are the characteristics of a "superproduction" like the one being shot here. In a production of such mammoth proportions even a sequence lasting only a matter of minutes in the finished film may cost several hundred thousand dollars. Skill and talent sometimes earn success for far more modest productions. One recent example is the Japanese production, "The Island" in which Kaneto Shinto tells the day-to-day life story of two peasant farmers on an island (right) who have to transport every drop of water for their field from the far-off mainland. The story is told without words. The film cost only $33,000 to produce, but has already earned more than $110,000 abroad.

Kindai Eiga Kyokai, Cocinor-Marceau Films

A full day's work: 2 minutes of finished film

a famous detective novel series for 600,000 francs ($1,200). The scenario comes later, depending on the director and the cast.

The producer then roughs out his plan of production costs while the scenario writer and director work out a shooting script. This is a kind of analytical blueprint of the whole operation. It enumerates all the camera shots (close-ups, medium and long shots), the timing and camera movements (tracking and panning) and details of direction (set arrangements, actors moves, the position of people and objects on the sets, etc.) as well as the commentary or dialogue.

At this point the literary aspect of the cinema ends and the technical side of production begins, while the financial side of production continues — for it starts from the moment that the idea for the film has been accepted.

Several days in the studio under powerful arc lights, or on exterior location depending on the whims of the sun, require the hiring of teams of technicians which vary in their multitude according to the size of the production (the director, cameraman, continuity girl, sound engineer, set designer, make-up man, etc... and their assistants) to say nothing of the cast (stars, other actors and extras, etc.)

There are too many people involved in the production of a film to list them all. Great Britain regularly employs 4,000 persons in the production of feature films alone, and it is estimated that 25,000 to 35,000 persons work in film production in the U.S.A. The Japanese film industry lists 120,000 employees, 18,000 for the production and distribution of feature films, 82,000 for film exhibition.

But are these figures complete? Are extras and other persons called upon included? Music in a film for instance means a composer, an orchestra, a recording studio staff. Do they always figure in these statistics?

Every sequence shot is printed on negative film, with very often several prints of some takes. In France, a full day's work produces an average of two minutes of the final film. The film is then developed and printed on positive film preferably in well-equipped laboratories as near the studios as possible. After this comes the editing, the mixing of image and sound, optical effects for transitions between shots (known as wipes, fade-ins, fade-outs, and dissolves, etc.) then titling, the making of duplicate negatives, and the running off of the final positive prints... Annual footage processed in French laboratories for instance amounts to 72 million metres.

So we see that to call film-making an industry is no idle use of the word. Before even the smallest of films can be envisaged all the financial and technical requirements of a big industry come into play. That is why

Quite apart from their basic aim which is to encourage the public to buy someone's products, publicity films occupy a special place in the film world. They offer young producers the opportunity to display creative originality. Some of them are minor masterpieces of the film-maker's art. Through application to publicity films animated cartoons have, in particular, found ways to perfect techniques and discover new ones.

Cinéma et Publicité, Paris

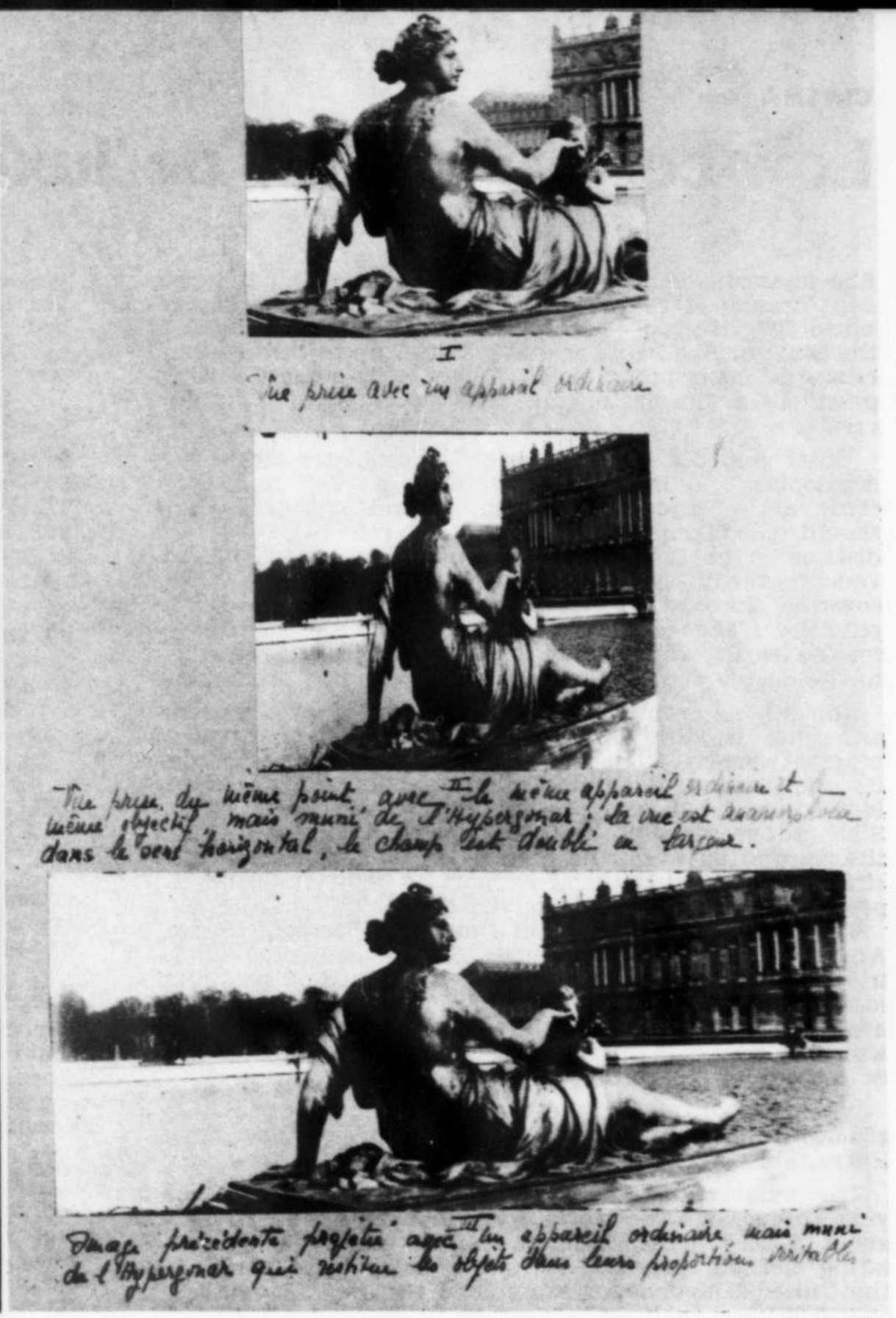
CINEMASCOPE INVENTOR'S NOTEBOOK

The film industry has reacted to the prodigious growth of television by a vigorous search for innovations. One of the most far-reaching decisions, designed to retain public patronage of the cinema, has been the introduction of wide screen projections. This opened the way, in 1953, to the development of a technique invented years earlier by a Frenchman, Henri Chrétien. The result was the birth of Cinemascope. Reproduced on the right is a page from the notebook of Professor Chrétien, inventor of the Cinemascope lens and camera, with the following annotations.

I.—Shot taken with a normal camera.

II.—Shot taken from the same point with the same camera and lens, but now fitted with a Hypergonar: the shot is distorted horizontally and the breadth of the field of vision is doubled.

III.—Previous shot projected by a normal projection apparatus fitted with Hypergonar which has restored all objects to their true proportions.


I
Vue prise avec un appareil ordinaire
II
Vue prise du même point avec le même appareil ordinaire et la même objectif, mais muni de l'Hypergonar : la vue est dilatée dans le sens horizontal, le champ est doublé en largeur.
III
Image précédente projetée avec un appareil ordinaire mais muni de l'Hypergonar qui restitue les objets dans leurs proportions véritables

20th Century Fox

another important person in film-making—the ever-present, formidable film producer—keeps his eye on production from the first moment to the last. It is he who fixes the budget of the film and sees that it is adhered to. The budget is based on the film's profitability, or returns, that is, on the estimated money it will bring in. The budget commands the greatest respect, for even in the world of the cinema a Maecenas is a rare bird.

In fact its real Maecenas is the public, twelve thousand million patrons each year in more than 175,000 cinemas around the world ; and this does not include what the trade calls non-theatrical (that is, non-commercial) showings which would triple or quadruple the figures. It is no easy matter therefore to forecast what the public interest will be. What is more, each film has its own public. There are not many films like *Gone With the Wind* which had an audience of 70 million spectators. And yet it is the overall returns of an average film which condition the budget of a new film.

The financing of films is dealt with by each country in its own way. Without going into details of the mechanics of financing, the problem in the Socialist economies and in the major American companies is relatively simple. In both cases the anticipated returns of a new film are estimated and the financial risks spread over several films. The budget is then fixed and the required funds are drawn upon as needed.

In a Socialist economy film organizations operate like a government ministry possessing a special budget for the production of educational and information films. They order a film on a particular subject, grant the appropriate budget, have the film made and control every phase of its execution. Profitability is assessed not for each film individually but on the basis of the total returns of all national and foreign-made films shown in the country.

With the major American films financing is more speculative. Backing is usually assured by commercial banks or large industrial concerns. In turn the leading film companies themselves (which control production, distribution and cinema circuits) invest most of their capital outside the film industry.

Thus in both systems the risks are greatly diminished by being widely spread. Future film production in both cases depends more on the graph of national cinema attendance generally than on the success of their own films.

When an independent company decides to launch into film production, the problems of financing are a matter of much graver complexity. The risks involved are infinitely more serious since any single set-back, like the illness or death of the leading players or of the director in the middle of shooting, or the public's cool reception to the film once it is released, can spell complete disaster.

Some of these risks, such as accidents, illness, bad weather, the loss of film by fire, are of course covered by insurance ; and insurance companies often allow premiums to be paid after the release date of the film. Despite this, an independent company has to be prepared for heavy expenses and must find the needed credit.

In France, for example, the 1951 total investment in the different branches of the film industry amounted to 3.5 thousand million Francs (over $7 million) for a production total valued at about 5 thousand million Francs (over $ 10 million). This investment represented 66 per cent of the value of France's total film production for the year, and was a national record for all industries (the steel industry came second with only 37%.)

Where does this backing come from? First, there are the contributions by the producer, then from private sources, and loans from banks. Some banks specialize in

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Low-cost films vs. de luxe superproductions

film-financing loans. In Italy, for instance, an independent branch of the Banca Nazionale del Lavoro finances up to 60% of production costs, and in Brazil the Bank of the State of Sao Paulo grants credit of up to three million cruzeiros upon presentation of an early-stage "cutting-print" of a film costing on an average 5 to 7 million cruzeiros.

Other sources of financing backing are the large developing and printing laboratories as well as technicians, artists and film distributors and exporters. Note should be taken of the important role played by the distributor in financing film production, either by advancing credit against future box-office takings or by covering the cost of general release prints and advance publicity. The conditions laid down by the distributor for the leasing and exhibition of a film will vary according to the degree of his financial participation in production.

The State too finances the production of private films, and this is now becoming an increasingly frequent practice. Apart from the subsidies and loans accorded for the making of cultural films (particularly documentaries) there is a growing tendency on the part of the State to use the proceeds of special taxes on cinema tickets, and levies on the footage of films being shown in cinemas, to give financial support to films it wishes to promote, and thus mould public taste.

This is now being done in Denmark, Portugal, Egypt, Argentina, France, Italy, Brazil, Greece and other countries. The funds are used for the granting of subsidies, loans and advances on box-office takings, or for the awarding of big prizes for completed or projected films which by virtue of their quality or the ideals they espouse do honour to the nation's cinematographic output.

When people refer to the film-producing countries they generally have in mind full-length or feature films. Regrettable or not, let us follow this custom.

The number of 35 mm. feature films produced each year throughout the world for public screening runs to about 3,000. No exact figure can be given since tabulating methods vary widely from country to country. In the United Kingdom for example, a feature film must be over 3,000 feet in length, while in Italy it cannot be less than 6,500 feet.

Consequently, the national figures given below should be interpreted with caution, particularly since there is often no way of telling if certain co-productions have been counted twice in two different countries. The figures used here will be those provided by the International Federation of Film Producers (1959 figures).

ASIA leads the other continents with 1,580 films produced annually, or more than half the total world cinema production. Japan (493 films), India (310) and Hong Kong (240) are the world's three largest producers. These are followed in Asia by South Korea (109) and mainland China (80). Burma, Thailand and the Philippines each produce about 50 films a year.

The United States occupies fourth place in the world with 187 films, or half of the total annual production in the Americas: Mexico (84), Brazil (40), Argentina (23).

Europe produces 950 films a year: Italy (167), France (133), U.S.S.R. (about 130), Great Britain (123), Federal Republic of Germany (106), Turkey (60), Czechoslovakia (35), Eastern Germany (27).

Sixty films are produced in Africa, 50 in the United Arab Republic alone. If most people are aware of the world-wide distribution of American films, it is not always realized that the cinema of Asia too is a thriving, dynamic industry which reaches wide audiences. Although the bulk of its production is geared to meet the tastes, customs and culture of the people of Asia, Japanese films have been enthusiastically received in Europe, and Indian films are finding a growing public in African countries.

How can we explain the amazing development of film production in Japan? In their book, *Le Cinéma Japonais,* Shinobu and Marcel Giuglaris tell us that "The film industry is designed to make money and is not protected by the State. Five large film corporations each possess their own studios and production equipment, their own financing methods and distribution chains, their own cinema theatres, stars and technicians. A sixth large group specializes in films for export.

Each of the first five groups produced a film a week in 1955 at the modest cost of 18 to 25 million yen ($50,000 - $70,000) and made a return of 50 to 70 million yen ($150-200,000) within a month from national receipts alone. Thus, according to Giuglaris, one month's production time and only one month's exhibition brought the producer, after deduction of all expenses and exploitation costs, a net profit of over 100%.

The low production cost of Japanese films is explained by the fact that the actors are not paid astronomical salaries, that there are no trade union rules decreeing a minimum number of technicians per film, and that long sequences with fixed cameras are a standard technique, thereby greatly reducing the number of shots.

IN addition to these films made for home consumption, there are those made for foreign screening which, especially since the success of *Rashomon* are allocated a higher budget, though *Rashomon* itself was made for only 15 million yen.

If we remember finally that there are 7,400 cinemas in Japan—66% of which show nothing but Japanese films —with a seating capacity for over 3 milion people, and that more than 1,000 million spectators attended the cinema in 1959, then is not difficult to understand the enthusiasm of this nation for moving pictures and the development of the Japanese film industry to meet it.

The United States offers a well-known example of the concentrated importance of a film industry under a free economy. Eight major corporations dominate the film business. They release 60 to 70 per cent of the total volume of feature films produced, and through their their own distribution and exhibition outlets account for up to 85 to 90 per cent of America's gross box-office receipts. In addition, their influence extends abroad where their subsidiaries or affiliated companies often enjoy a predominant position with regard to distribution and film booking. As the French economist, Professor Henri Mercillon has written: "Hollywood has taken over the field of entertainment for a whole sector of the world."

Alongside a host of "B-pictures" made at medium cost, Hollywood turns out a substantial number of high-budget films which follow certain aesthetic standards that flatter the public's taste. Such films feature big-name stars and are released with an advertising build-up commensurate with their cost. The de-luxe superproductions call for gigantic installations and organization, and it would seem could only be filmed by or in Hollywood.

Yet now a drive is being made to outdo Hollywood and the Cecil B. de Mille technique by Italy's *Cinecitta* studios outside Rome which are churning out elaborate spectacles based on a formula of mythology and ancient history. With its superproductions, America at any rate has hit the box-office jackpot on the world's markets.

Thus though their production techniques are fundamentally different, both Japan and the United States are the world's leading film countries. It is interesting to note, however, that both industries are characterized by a high degree of concentration of their economic structures.

In other free economy countries, and for that matter in Japan and the United States as well, one finds a wide variety of film producing companies in existence. These range from the individual craftsman who produces and directs his own films to the giant industrial complexes with their multifold technical, commercial and administrative services.

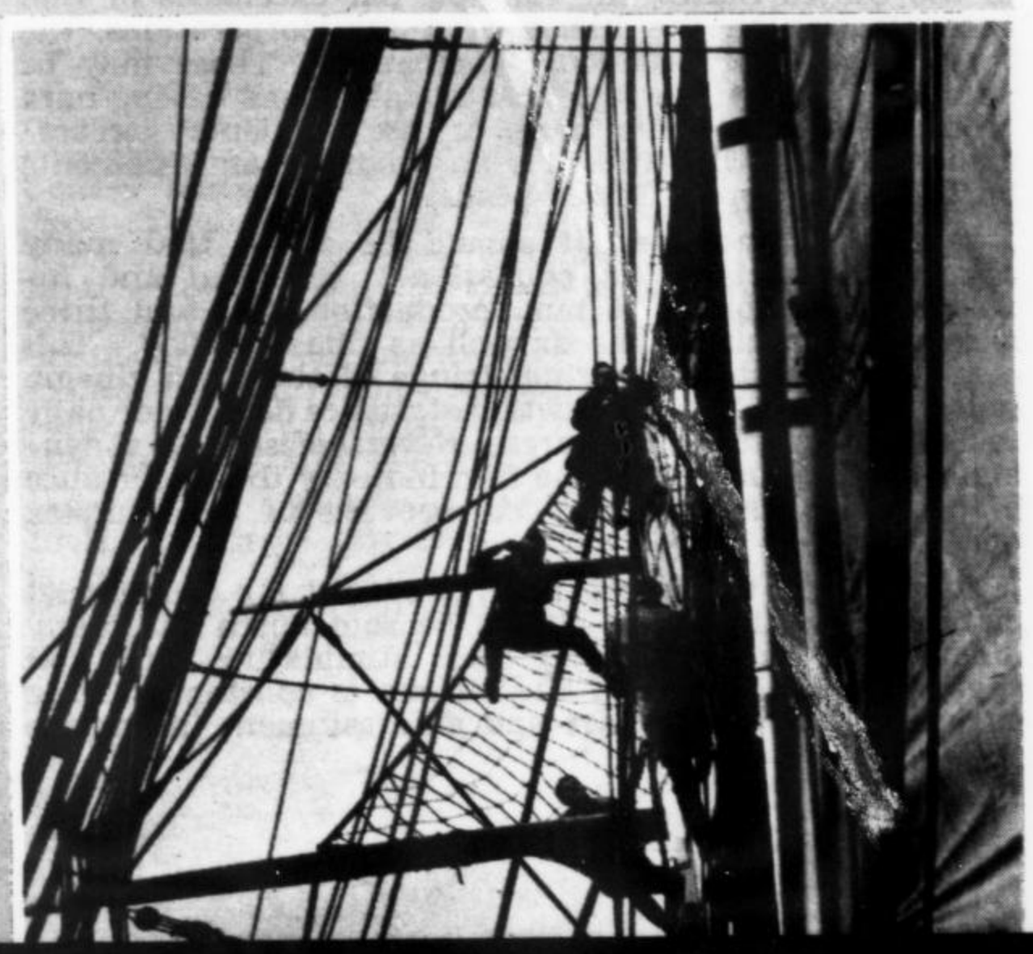
To attempt, under these circumstances, to record the number of film companies operating in the world, or even by country, becomes a statistician's nightmare. The diversity of companies in terms of capital, staff, volume and type of production, access to national and foreign

CONT'D ON PAGE 28

Photos © Almasy, Paris

BOUNTIFUL JOURNALISTS

A three-masted sailing vessel specially built for a new version of the American film, "Mutiny on the Bounty" sets out across the waters of the English Channel with 80 journalists and photographers on board (see photos). The launching of a feature-length film is usually the occasion for a vast publicity campaign. In the case of de-luxe superproductions the need for a rapid turnover of the huge amounts of capital involved leads to campaigns being started while the film is still under production. The budget for publicity can run to as much as 7% of the total production costs.



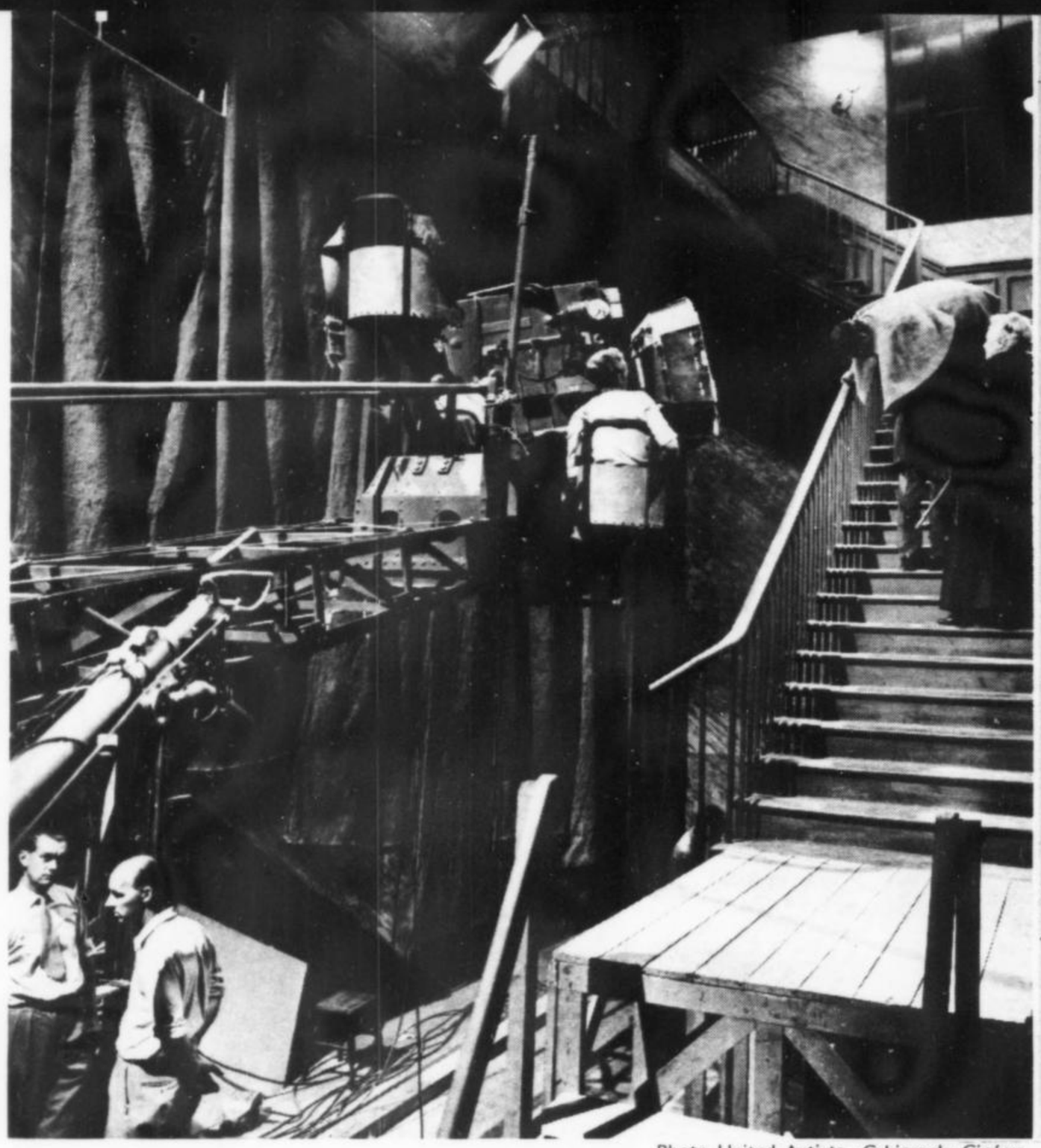


Photo United Artists - Cahiers du Cinéma

SUSPENDED ANIMATION

The Soviet film, "An Unsent Letter", which recounts the adventures of a group of geologists in the Siberian "taiga", is distinguished by the remarkable shots of cameraman Sergei Uroussevsky, a technician who seeks always to work in real-life surroundings. On right he is seen suspended with his camera above the ice-floes of a swirling river. Left, operating on an indoor film set, the camera poised on the end of a massive "boom" follows the actors up a stairway, in John Huston's film "Moulin Rouge".

Pioneer role of independent companies

markets, makes it well nigh impossible to lay down any common yardstick.

Furthermore, certain countries have special regulations governing the establishment of film companies. In Italy a company cannot be set up for co-production operation if its capital fund is under 30 million lire. In France a professional licence is required which is denied persons with a police record or firms of limited capital (less than $10,000 for the production of feature films; and less than $2,000 for short films). Records show that in 1961, as many as 617 feature film companies were in existence in France and 960 short film companies, but the output figures show only 145 feature films and 326 short films actually produced during the year. Thus it is quite obvious that the number of really active producing companies is much smaller than the impressive official list would imply.

The situation is no different in other countries. Even in the United States, the example par excellence of film concentration in the hands of a few corporations, the figures show 181 producing companies. These may be accounted for by the fact that certain firms having once produced a film under more or less accidental circumstances retain the title of film-producer as ornaments on their commercial letter-heads.

In fairness, however, it should be added that many companies specialize in educational, technical and industrial films, or in 16 mm. production, two and three minute advertizing films as well as films for T.V. This output represents a marginal fringe of the main cinema industry, and official production statistics do not normally include them in their figures. Nevertheless it is a dynamic, bustling branch of the film industry the importance of which is rarely suspected because of its complex operations.

To get back to feature films produced for commercial circuits, a further word should be said about the many independent producers and their stimulating effect on the industry. In fact, if the cinema is constantly being enriched as a form of art and entertainment in various countries (and indeed on the world market generally) much of the credit is due to the push and competition created by the independent film companies. In their efforts to establish a reputation, the enterprising independents have not hesitated to break with the traditional approach of the big film corporations and have pioneered new forms of cinema expression.

In the Socialist economy countries nationalization of the film industry is the rule, production being planned and financed by a ministerial department. Apart from the director, all production technicians are attached to a given studio and receive regular salaries.

In Poland, the Barrandow studios alone employ 1,800 persons regularly, while in Czechoslovakia at least, all actors are hired for a specific film. In Yugoslavia, persons engaged on the creative side of film making were formerly employed on a regular salary basis, but in 1951 film production was decentralized and a new basis of worker-management adopted, leading to an increase in the number of film producing companies in the country. As a result film directors and other creative personnel have been recognized as members of the liberal profession with the right to sign separate contracts with film companies. But most technical and administrative personnel remain on permanent contract to a given company.

Up to now we have been dealing only with feature films, but if we were to consider the footage processed in all the world's film laboratories, separating feature film footage from all other types (excluding amateur and TV footage) the figure would certainly be startling and prompt us to want to revise our current methods of tabulating world film production.

The plain fact is that present world statistics do ill justice to the short film. Admittedly, there is no universally accepted definition of how short a short film should be. Finland says less than 2,000 feet, the U.K 3,000, France 4,250, Portugal 5,900 and Italy less than 6,500 feet.

But it would be a serious mistake to underestimate the continued growth and expansion of the short film, its

Photo Soviet Screen

richness as a medium of expression, and the important place it occupies in the world today. A very conservative estimate of the total number of short films produced each year gives us a figure running into several scores of thousands!

The short film is not often made by the large feature film companies; it is usually left to the small, artisan-type producer since it involves a much smaller expenditure. For example, the average short film made in France in 1961 cost 51,000 New Francs ($10,000) as compared with 1,370,000 Francs ($275,000) for the average feature film.

But unless it is subsidized the chances of a short film recovering its production costs are much slimmer than for the more expensive feature film. Even those films produced for commercial cinema showing are very rarely aimed exclusively at this market, except for featurettes of the "curtain raiser" type such as short comedies or dramas, or light variety shorts and musical briefs, or documentaries considered to be of broad general interest. Just as often they are aimed at the non-commercial market, assuming they were not originally produced chiefly for non-commercial distribution. Of course, certain types of short films, like the technical, scientific and educational films, never aim at anything but a non-commercial screening, and some are even produced only in 16 mm.

When a short entertainment film is commissioned by public or private backers who are not primarily interested in getting their money back there is no real problem; but there *is* a serious problem when we turn to the short experimental film, independently produced. Here financial backing is much more difficult to come by since such films do not find a ready market. The experimental film is thus in danger of disappearing for lack of financial support or exploitation possibilities.

Luckily, many governments are showing concern for this problem and are taking steps to remedy the situation. The production and distribution of such films are being encouraged by the offer of subsidies, loans, special film prizes and tax concessions; in certain countries the double feature has been completely banned, and cinemas are required to include short films in all programmes.

We should not forget that short films, be they documentaries, animated cartoons or featurettes, offer the film world unusual scope for creative originality, and that it is from this branch of the industry that the great film makers of tomorrow are likely to come. Like the full-length feature, the short film too now boasts its own "schools" and outstanding directors whose masterpieces are in no way inferior to the feature film classics.

The special problems confronting short film production have been recognized not only in the free-economy countries but in the Socialist States where significant measures have been adopted to encourage new films. Thus in Czechoslovakia while 80 per cent of the short films produced are State-ordered, the remaining 20 per cent are made up of freely-produced films proposed by art councils set up in Czech studios.

Of the many types of short films turned out annually for non-commercial use, the educational film is finding an increasingly important market. Educational films are often produced directly by government bodies or else are commissioned and financed by the State. The French *Centre audio-visuel de l'Ecole normale supérieure de Saint-Cloud*, near Paris, exclusively devoted to films for schools, is an interesting example. It undertakes comparative studies of audio-visual techniques in classrooms, advises film makers and directors as well as teachers, organizes film seminars, and produces its own experimental films in its own studios. Most French educational films, however, are privately produced though State commissioned and supervised.

In certain countries all educational film production is in the hands of private enterprise and no State control is exercised. This is true of the United States where educational productions are made by the large film companies and by several independent organizations. The

CONT'D ON NEXT PAGE

Boom in co-productions

unusual thing about these producers is that frequently they are actually specialized branches of book publishing firms. Textbooks, in fact, include references to films which are specially adapted to or can appropriately be used in conjunction with one chapter or another of the textbooks in question. In Japan an Educational Film Producer's Association groups 80 of the country's most active companies, about a dozen of which account for roughly one third of all educational and industrial film production (approximately 200 school and adult education films were produced in Japan in 1958).

In the past few years, however, there have been signs of the government's growing interest in promoting better educational films. Production and distribution remain free of government control but an audio-visual education section has been set up in the Japanese Ministry of Education to encourage the use of films in schools, and a selection committee created to help teachers and adult education leaders to choose appropriate films. In addition, an annual educational film festival in Tokyo is spurring the production of better educational films.

Closely associated in certain ways with the educational film are the various industrial films which play an important part in professional training and are used in "refresher" courses for executives and specialists in industry. To cite the case of Japan again, of the 768 technical films produced in 1958, 200 were concerned with education proper while the majority of the remaining 568 dealt with industry.

THREE other types of specialized films, all highly distinctive, deserve mentioning here: the newsreel, the advertising film and the television film.

The newsreel is unique in that it appears at regular, relatively brief intervals, and deals with various subjects directly connected with current events. With the advent of television, however, it is being forced to consider a change of pace. Unable to compete with daily TV programmes in presenting the spot news of the week as it formerly did the cinema newsreel is rapidly tending to become a kind of illustrated magazine featuring specific events of the day in analytical capsule form.

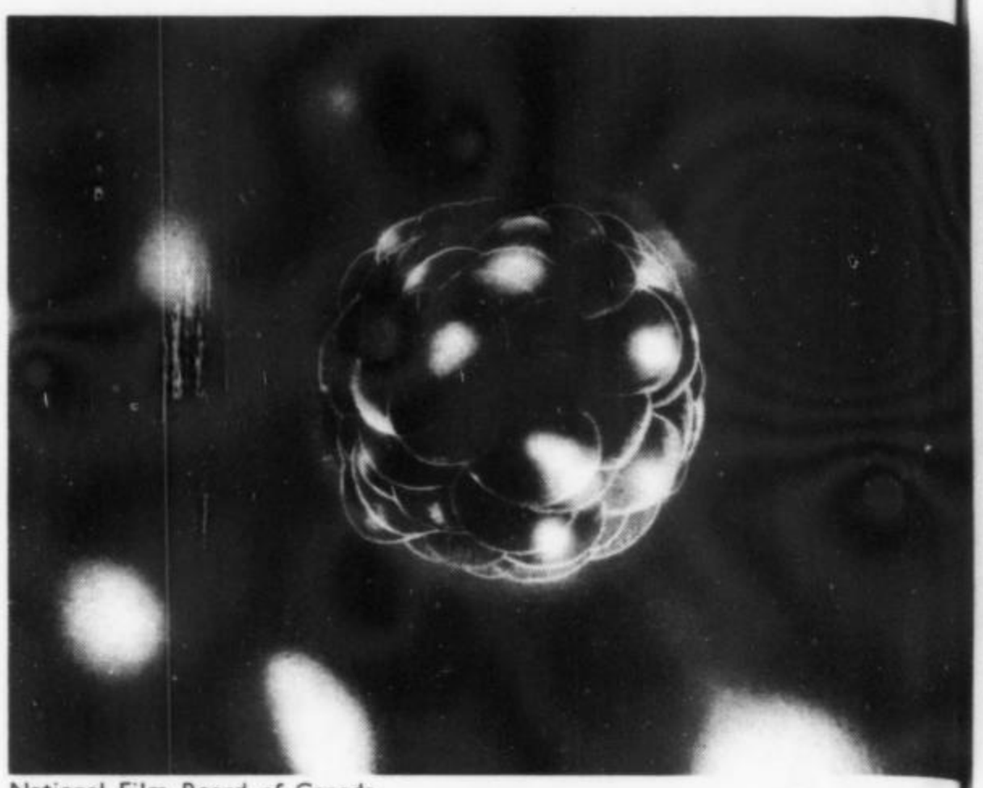
The status accorded the newsreel varies from country to country. In some it is entirely a private, commercial affair (Argentina, Austria, Belgium, Colombia, Fed. Rep. of Germany, France, Ireland, Israel, Italy, Japan, Netherlands, Peru, U.K., Uruguay, etc.); in others it is regarded as a public service or is nationalized (India, Norway, Portugal, Spain, the Socialist economy countries, etc.)

We shall not say much about the advertising film, which is extensively used in fairs and exhibitions as well as in public cinemas during intervals, except to point out that many film people have made their cinema debut in this branch of the industry and that it has proved a rich medium of expression for the animated cartoon, and an exceptionally good vehicle for perfecting and renovating the style and technique of the animated cartoon generally.

As for television films, though broadly speaking both TV films and films for the cinema use identical recording techniques their production methods are radically different. TV films are rarely conceived as single units but are usually produced (at least for commercial television) as package programmes comprising 13 films for showing over a 13 week period.

TV films require special adaptation of the frames to the small television screen and also present particular editing problems. Furthermore, in a TV film the performers act out their roles from beginning to end, following the script as in a play, unlike cinema actors who are filmed in unconnected "takes". Nonetheless there is no denying that cinema and television films have much in common.

Although TV companies often produce their own films yet at the same time private film corporations are also

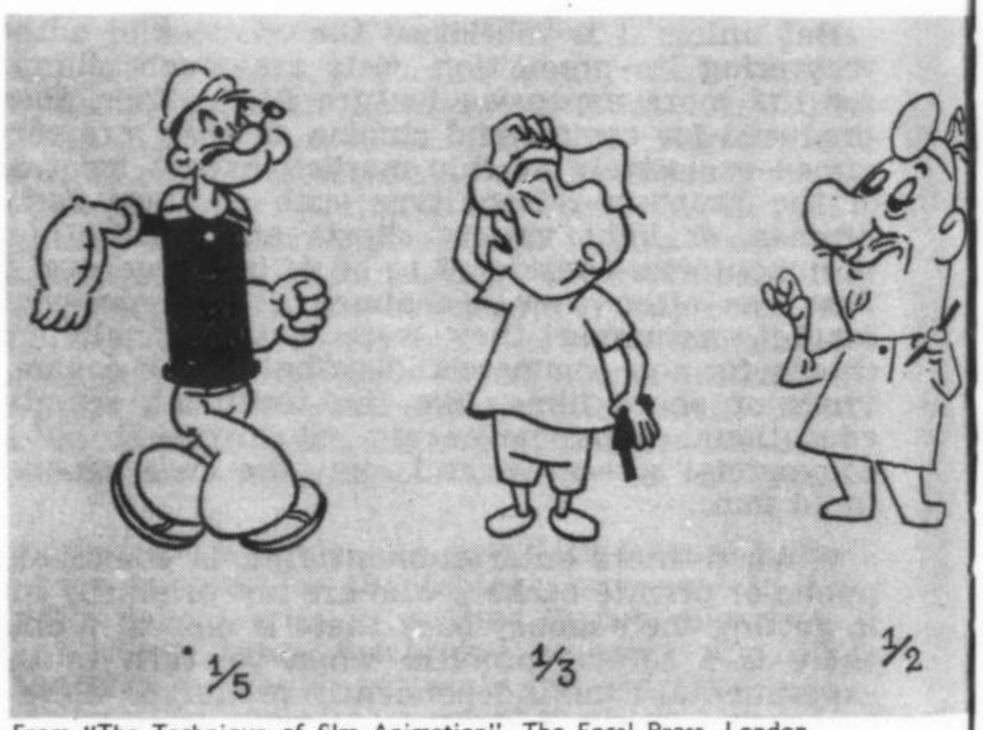


National Film Board of Canada

SCIENCE ON THE SCREEN. The National Film Board of Canada has won international renown for the quality and scope of its short film productions. Above, a shot from a film on the subject of cancer. This drawing shows a multicellular growth.

Ministry of Information, New Delhi

THE METRIC SYSTEM. India has recently adopted the metric system. To help explain this innovation to the man in the street, an animated cartoon showing its uses was produced in 1960 by the Government Films Division.



From "The Technique of film Animation". The Focal Press, London

BIG HEADS FOR SMALL SCREENS. The tendancy to exaggerate the size of the head in relation to the body is a feature of American cartooning, especially since the arrival of television. The small TV screen calls for means to accentuate character and expression. The figures under the drawings (above) show the approximate head to body proportions used by artists who draw three well-known animated cartoon characters.

CARTOONS AND PUPPETS FOR LAUGHS OR LEARNING

The short film has known an immense growth and expansion in all its forms during the past 15 years. This has come about not only to meet the needs of television and publicity, but also because of the pressing demand for educational films. The annual production of short films has been conservatively estimated as running into several scores of thousands. As photos on these pages demonstrate, animated cartoons and puppets can be used as effectively to teach serious lessons of many kinds as for light entertainment.

Film Export, Prague

DOLLS AND LEGENDS. The screen has brought fame to dolls used by the Czech film-maker Jiri Trnka. Painter and illustrator of children's books, Trnka was the producer of a Unesco film entitled "Fable for Friendship". Above, a scene from one of Trnka's puppet films "The Song of the Prairie".

called in (in the free economy countries) to produce others. This example of collaboration, at least as far as specialized film production is concerned, is a hopeful sign indeed, particularly since relations between the two industries have not always been of the best.

In fact at the Tangiers Conference called by UNESCO in 1958 to further international co-operation between the cinema and television industries one could not help noting the bitterness of the cinema people towards their television "juniors". They complained that the fees paid by TV stations for commissioned films were too low (relatively speaking that is) and that they could rarely cover their production costs from TV broadcasting channels alone.

In time solutions acceptable to both sides will certainly be found. As it is, films produced by public or nationalized services are nowadays widely diffused through the cinema and on TV. In the near future, co-productions resulting from co-operation between these two media will no doubt point the way to a new and profitable opening for films.

In their search for greater profitability, feature film producers are today being drawn increasingly to the solution of international co-productions. The past already offers good examples of this trend: *Cavalcade* which had a marked effect on the distribution of American films in British cinemas and *Henry VIII*, which opened the door to the American market for some major British films.

The formula offers obvious material benefits. Endowed with dual nationality the co-production can skirt many obstacles to film distribution in its "parent" countries. Its financial advantage is that production costs are shared.

Viewed in terms of international co-operation the arrangement also has much to commend it. Professional actors and film-makers of different nationalities apply skill and effort to a common end. Technicians and creative workers get to know each other better and this in turn helps to stimulate better understanding between the people of their countries.

The co-production method has nevertheless come in for some sharp attacks from groups concerned with preserving the integrity of national expression. Art, say these critics, is an expression of national culture and when two countries combine their artistic efforts in an artifical alliance the result may be a hybrid product which satisfies neither the ideas and feelings of the spectators in the two nations nor those of foreign audiences which prefer films offering authentic cultural backgrounds that differ from their own.

But criticism of this kind must not be pushed to absurd lengths. For every strictly national topic that would be unsuitable for co-production treatment, there are many others which deserve to be handled in this way.

How do co-production arrangements work in practice? Many forms exist but the most common is based on an equal reciprocity covering two films. Let us suppose that the first of these films is a Franco-Italian production. The French company will foot the major part of the cost while the Italian partners will be required to find not less then 30% of the total estimated outlay. French technicians and actors will outnumber Italians. After this film is completed a counterpart Italo-French production will be made in which the proportions of the financial, technical and artistic contributions will be reversed.

Arrangements of this kind are usually covered by an official inter-governmental co-production agreement such as existed between France and Italy in the example just given. The films produced benefit from privileges normally reserved for nationally produced films in both countries—State financial aid, tax concessions, quota privileges and other advantages designed to aid a national film industry. A joint commission decides which films qualify for these benefits before production begins and also supervises the working of the agreement. In 1961, 88 feature films were co-produced by France and Italy in this way.

In another and more simple type of co-production—usually outside the scope of official agreements—foreign capital is used to finance production, or alternatively, foreign technicians and actors participate in a film produced with local capital.

In such cases the film does not always benefit from a dual nationality status. The resulting loss of privileges may in some measure be compensated for by a more profitable distribution of the film in the country which provided the technicians and cast.

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Films for schools of all nations

Nowadays there is a much greater use of foreign capital for film production because of increased restrictions on the export of film-showing receipts. Large amounts of capital earned by foreign films are now "frozen" in some countries. Unable to export their profits, foreign producers have been using them to finance co-productions locally. Countries where this happens benefit in two ways: films made with "frozen" funds often provide employment for local labour and technical staffs, and the films themselves are likely to have a wider distribution abroad through the participation of a foreign co-producer.

Co-productions of this type have nevertheless disturbed the technicians' trade unions. In the United States the problem of what the American trade journal *Variety* has called "runaway" film production has attracted much attention. The question has been raised and discussed by the Labour Commission of the House of Representatives. U.S. trade unions affirm that 509 films made between January 1949 and November 1961 were financed from U.S. sources.

Turning to educational films we find that co-production has been tried out experimentally on quite a large scale although on very different lines from those already described. The overall problem here is obviously not the same. Basically each country tries to produce a number of educational films corresponding to the needs and content of its school programmes. Through consulations and exchange of information between the various national educational film services, a wasteful duplication of effort such as the possibility of several countries producing a film on exactly the same subject—is avoided. International co-operation in this connexion benefits all concerned.

Joint agreements sometimes lead to the production of a series of films (physical and general geography and the history of science have been three examples) each film being made by a different country. Eventually each producer country supplies to the other partners in the project the material needed for making prints of its film, free of all dues and charges. Thus each country receives several films for the cost of one production.

An example of an even more ambitious development in educational films is offered by the film, "Climatic Regions of Europe", produced by the International Educational Film Council. Four countries agreed to make sequences presenting Europe's different climatic conditions: the German Federal Republic for continental climate, the United Kingdom for oceanic climate, France for the Mediterranean climate and Sweden for the Arctic. An introduction in animated cartoon form was made by Denmark and the entire operation co-ordinated by Sweden. Contributions towards the cost of the project were made by UNESCO and by the members of the International Educational Film Council in proportion to each country's share in the council's budget.

An account of these experiments and of several others —a co-production with the United Nations and two co-productions with broadly cultural themes (*The Open Window* and *December, The Children's Month*) has been given in a UNESCO booklet (1). This publication will be of immense value to future educational film-makers since its authors explain at length the mechanics of co-operation and with admirable candour deal fully with the problems they met and the mistakes they made.

Increased international co-operation of this kind will do much to open the way and smooth the path for future educational films. This became clear at the UNESCO-sponsored meeting in Kuala-Lumpur, Malaya, in August 1961, which brought together the heads of national audio-visual aid departments in countries of South and East Asia. Guided by the results of the experiments already described, these specialists agreed to carry out a joint production programme of films on human geography and natural science, as well as other projects.

Since it combines both art and industry, the cinema needs technicians, specialists and creative workers in many fields. The "on the job" training of the early days has now been replaced by highly skilled and specialized instruction in schools specifically created for this purpose. Most of these training schools, affiliated under an International Liaison Centre for Cinema and Television Schools, are in Europe—Potsdam-Babelsberg, Madrid, Paris, Athens, Budapest, Lodz, Rome, Prague, Moscow, Vienna, Munster, Kiel, London and Amsterdam—and in several universities of the United States. Others are operating in La Plata, Cairo and Taipeh.

Professional training given in these centres covers the creative roles in film-making (directors, actors, art directors), the administrative (associate producers) and the technical (operators, sound engineers, laboratory technicians etc.).

In addition there are audio-visual training centres where teachers learn to prepare or to make use of the multifold items of equipment now employed in today's visual and sound information media, equipment which has proved of much value in the classroom.

Tomorrow's cinema is already taking shape in such schools and centres.

(To be continued)

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This survey was undertaken by Paul Léglise, at the request of UNESCO's *Free Flow of Information Division of the Department of Mass Communication and carried out under the auspices of French National Commission for* UNESCO. *Mr. Léglise is head of the cultural and short films service of the Centre National de la Cinématographie Française in Paris. He is the author of several works on the cinema including,* "Methods of Encouraging the Production and Distribution of Short Films for Theatrical Use", *published this year by* UNESCO.

(1) (*"Film Production By International Co-operation". No. 34 in the* UNESCO *series. "Reports and Papers on Mass Communication", Paris* 1962.)

UNESCO CREATES KALINGA FILM PRIZE

UNESCO has instituted an award of £2,000 sterling for a feature-length film contributing "most effectively to public appreciation of an outstanding achievement in education, science and culture, resulting from international co-operation." To be known henceforth as the Kalinga Film Prize, the first award, for 1961-62, went to "In the Bay of the White Bears", a Polish film by Jaroslav Brzozowski about polar research during the International Geophysical Year. A French film, "Le Grand Secret" by Gerald Calderon received special mention.

Like the Kalinga Prize for the popularization of science created in 1951, the new award is a donation from Mr. Bijoyanand Patnaik, Chief Minister of the State of Orissa in India, and one of the directors of the Kalinga Foundation, set up to give full support to economic development and social and cultural progress in Orissa.

Films were submitted by Australia, Belgium, Finland, France, Japan, Mexico, Poland, Singapore, the United Kingdom and the U.S.S.R., and were viewed by an international jury appointed by Unesco, comprising Mr. F. L. Ammannati, President of the Centro Sperimentale di Cinematographia, Mr. Boris Milev, Permanent Delegate of Bulgaria to Unesco, Mr. Leopoldo Torre Nilsson, film director in Argentina and H.R.H. Prince Prem. Purachatra, President of the Mass Communication Committee of the National Commission of Thailand for Unesco.

Letters to the Editor

SECOND LANGUAGE FOR ALL...

Sir,

Your June issue (Antennas Across The World) highlights the appalling handicap of language.

This is the point in history, where, in considering this vast communication system for the world... Telstar, television, radio, etc.,... we should here make one concerted move for a second language common to all people of the world. With UNESCO preparing so admirably for the spread of mass media communications by 1975 to the world's illiterate millions, could not Esperanto, that proven international language be that medium?

A simple solution would be one year's tuition in Esperanto for all children of the world, when they, our future leaders in every walk of life, would be able to communicate readily with each other without interpreters, electronic brains and the like. Esperanto asks no country to give up its own language but merely to use it as a second one.

E. D. Allen
Dunedin, New Zealand

... SUCH AS ESPERANTO

Elstara sinjoro:

Ricevu mian humilan, sed sinceran kaj tutkoran gratulon pro la ci dumonata numero "El correo"-revuo.

La terura problemo, kiun oni komentadas kaj samtempe—studas amplekse en tiu interesega revuo, lasos sendube grandan influon en ciujn personojn, kiuj tutlande legos gin.

Certe ke tiu ci numero, "La luktado kontrau la malsato", kauzigos profundan impakton en ciujn konsciencojn. Mi certigas ci tion medidante la vortojn de Tibor Mende, kiuj aperas en aparta loko sub la titolo: "La humillación".

Ankau gratulojn pro la altega kultura kaj humana nivelo de via Revuo kaj pro la senlaca agado de Vi kaj viaj kunlaborantoj por tiom bela kaj dankinda misio, celante la vekadon kaj felocon de Homaro.

Kun antaudankoj, salutas Vin atente.

J. Vélez
Barcelona, Hispanio

ELUSIVE SCHOLARSHIPS

Sir,

Under General Assembly Resolution 845 Section (IX) of the United Nations' Charter, member states of the U.N. undertake to provide scholarships to students resident in non-self-governing territories to enable them to study in the scholarship-awarding countries.

I know many people in British Central Africa including Nyasaland who applied for these scholarships but in each case they were told: "Your application has been transmitted to the appropriate authorities of your proposed country of study and a copy has been sent to the Permanent Mission of the United Kingdom to the United Nations for observation... You may rest assured that any decision on your application will be communicated to you as soon as it is made known."

The decision on the application is communicated *on the Greek Calends.* This results in a waste of time; a waste of postage stamps and above all, the student fails to go to another university because he is waiting for the decision to be made known and does not, whilst waiting, apply elsewhere for a scholarship. Surprisingly enough, during my recent tour of Universities throughout the length and breadth of Europe, I never met any student from underdeveloped countries who claimed to be at University on UNESCO scholarships. Are the UNESCO scholarships bogus? Please elucidate.

L. M. Kwapata
London, England

Ed note: Unesco is not competent to answer our correspondent's criticism of scholarships administered by the U.N. and not by Unesco. As regards Unesco scholarships, although there are some available for students from underdeveloped countries, the majority of awards are for persons already well established in their careers to spend relatively short periods obtaining comparative experience in several countries. The number of Unesco scholarships is very small compared with the demand and, in fact, represents far less than 1% of the world total in any one year.

IN DEFENCE OF FERTILIIZERS

Sir,

In reply to Michel Lambert's letter (Are We Poisoning Ourselves?) in your July-August issue, I should like to point out that we cannot grow enough food if we simply leave Nature to do all the work. Yields of about 15 hundredweights of wheat per acre and six pints of milk or so per cow are simply not enough to provide a proper diet for everyone. We do not "poison" the earth by using chemical fertilizers. We improve it and also the quality of the harvests won from it.

Pierre Guillon
Crépy-en-Valois

AID WHERE AID IS NEEDED

Sir,

This is by way of a note of congratulation on the excellent. July/August issue ("Freedom from Hunger"). I have read it with great interest indeed, and thought that I should send along a few words of praise for a good job very well done.

Just for your interest, I am a member of the Royal Canadian Air Force Association, and last year our Association adopted as a national project that Wings and individuals should take on the support of underprivileged children through the Canadian "Save the Children" Fund, or like organizations. I am happy to report that already we have adopted some 43 children, and we hope to double this number this year. We realize that this is but a drop in the bucket, but is at least a step in the right direction, and brings home to our membership the great need of people in less fortunate circumstances. Through such knowledge we hope that the Canadian public will become better informed and increase our already considerable effort in aid to other countries in need.

G. E. Penfold
Don Mills, Ontario
Canada

CYBERNETICS & LINGUISTICS

Sir,

As linguists we are particularly interested in the latest achievements in the theory of information, especially the development of mechanical means of translating information from one language to another; we are also interested in problems of transmitting and preserving information on a world scale and in the possibilities offered by cybernetics for the solution of theoretical problems in linguistic research. Your journal has already published several articles on this subject, in particular, the article on the deciphering of the ancient Maya manuscripts by Soviet scientists (March 1962). We should like to see an issue devoted to the problem of cybernetics taken as a whole.

Wladimir S. Vashunin
Nikolai V. Nikolayev
Moscow, U.S.S.R.

A GESTURE FROM THE CLASS

Sir,

After reading in your magazine the appeal for help in saving the monuments of Nubia I talked about this problem to the class in which I teach the history of the East and of Greece. The pupils decided to contribute towards the protection of the Nubian temples from their pocket money. I am therefore enclosing a cheque for 25 New Francs raised by this collection. This is obviously only a minute sum compared with the total cost of the undertaking, but I feel that the gesture of these young French secondary school boys shows the interest that has been aroused by UNESCO's initiative.

F. Bedarida
Paris

From the Unesco Newsroom...

UNESCO ASKS AID FOR IRAN: The earthquake which devastated an immense area of Iran early last September had a disastrous effect on the country's developing economy. Altogether some 12,000 people were killed, 30,000 were injured and a further 90,000 made homeless; 150 villages were razed to the ground and 110 schools destroyed. The priority efforts of Iran's government have therefore been directed to providing medical care, food and shelter for the victims. In view of the extent of this disaster, UNESCO has appealed to its national commissions to alert people in their countries to Iran's need of help and to ask governmental and private organizations to give assistance so that the Iran Government may carry out a programme of educational and cultural rehabilitation in addition to the priority tasks it has already undertaken.

COMPUTER vs. LITERARY RIDDLE: Using an electronic computer, two Harvard University mathematicians recently identified the authorship of 12 essays believed to have been written by the American statesman, Alexander Hamilton, and by James Madison (4th president of the United States) which were published anonymously in 1787 and 1788. The mathematicians fed information on the frequency of key words in the essays and in the known writings of the two men, and from the results, identified Alexander Hamilton as the author of 11 of the essays.

BOOSTING AFRICA'S HIGHER EDUCATION: An Inter-African conference on higher education organized by UNESCO at Tananarive, capital of the Malagasy Republic recently adopted a plan destined to strengthen and develop 32 African universities. The plan forsees an expansion of students in higher educational institutions of 31 African countries from the present figure of 31,000 to 274,000 by 1980. To meet this increase 7,000 non-African and 14,000 African professors will need to be recruited during the next 20 years.

FLYING DOCTORS FOR AFRICA: A flying doctor service of the kind that has operated in Australia for the past 34 years is now being organized to work from bases with dispensaries throughout Northern Nigeria. The Australian Government recently presented the African service with a pedal wireless "transceiver" a modern equivalent of the equipment first devised for the Australian service. In Australia, the Flying Doctor Service now operates from 13 bases to cover about two million square miles and records more than 10,000 radio calls to its clinics in a year.

MARITIME MUSEUM ATTRACTION: Visitors to the Stockholm museum which houses the 17th century Swedish warship "Wasa", salvaged last year from the waters of Stockholm harbour, have broken all museum attendance records in the Swedish capital: in 5 months entries exceeded 250,000. A Swedish naval specialist recently stated that examination of the "Wasa," which foundered on her maiden voyage in 1628, showed that faulty design was not the cause of the disaster, as had hitherto been believed.

GLACIERS IN RETREAT: The Franz Joseph Glacier in New Zealand's South Island retreated 300 feet between 1960 and 1961 according to the New Zealand Geological Survey, and during the past ten years this great river of ice moved back 3,500 feet. The retreat of the Franz Joseph and the neighbouring Fox Glacier is due to lighter rain and snowfall during this period.

STAMPS AGAINST HUNGER: DR B. R. Sen, Director-General of the U.N. Food and Agriculture Organization has appealed to all member countries to make a special issue of stamps in support of the Freedom-from-Hunger Campaign (See THE UNESCO COURIER, July-August 1962). He has suggested that World Freedom-from-Hunger Week, to be observed in the last week of March 1963, would be an appropriate time for the release of these special stamps.

UP-TO-DATE SCARECROWS: Modern technology has found more efficient ways of protecting crops from raider birds than the use of the traditional scarecrow with his battered hat and ragged garments. In Australia, following research into the significance of different bird calls, recordings made of warning signals given by certain birds have been amplified over loudspeakers in the fields and have effectively scared birds away from the crops.

FOR BETTER SCHOOL BUILDINGS: A world-wide network of centres dealing with educational building, linked by an international centre, has been proposed by educators and architects from 59 countries meeting in London at the International Building Conference, organized by the U.K. National Commission for UNESCO. The Conference recommended that the International Centre should be operated by UNESCO which has already set up school construction centres in Khartoum, for Africa, and in Bandung, for Asia and Oceania.

EDUCATIONAL BOOKS ON DISPLAY: On the occasion of the 12th Session of the Unesco General Conference (November 9 - December 12, 1962) an international exhibition of educational books for use in the developing countries is being held at the Palais de la Découverte in Paris under the joint patronage of the French and United Kingdom National Commissions for Unesco. Seventeen countries and 200 publishers are represented and 3,500 books displayed. The exhibition is open from November 14 to December 12.

COMPUTER SKIPPER & NO CREW: Down the broad river Dnieper in the U.S.S.R. sails a diesel ship, the "Laboratoria," skippered by a computer and with a crew of automatic machines. She manœuvres accurately on turns and avoids shoals. Depth finders and other instruments flash information to the computer which immediately issues orders. The "Laboratoria" is being used by research workers of Kiev colleges, hydrologists and radio specialists to study widely varied systems of ship automation.

WORLD TYPOGRAPHY MUSEUM: A major event during celebrations marking the 2,000th anniversary of the founding of Mainz in the Federal Republic of Germany, was the dedication of the World Museum of Typography to one of the city's most famous men, Johannes Gutenberg. The new museum englobes the former Gutenberg Museum and includes the reconstructed 15th century typography workshop of Gutenberg alongside an ultra-modern automatic book printing machine.

★

In the biographical note on Mr. Rex Keating (Digging for History) in last month's issue the title of Mr. Keating's book was erroneously given as *Twilight of the Gods*. The correct title is *Nubian Twilight*.

Flashes...

■ *An international fleet of oceanographic research ships will survey the fishery resources of the tropical Atlantic next year under a plan approved by the 44-nation Intergovernmental Oceanographic Commission which met at* UNESCO *House in Paris.*

■ *Schools in the U.S.S.R., from primary to university level opened their doors to about 40 million students at the start of the 1962-63 school year. The period of obligatory education has now been increased from seven to eight years in the Soviet Union.*

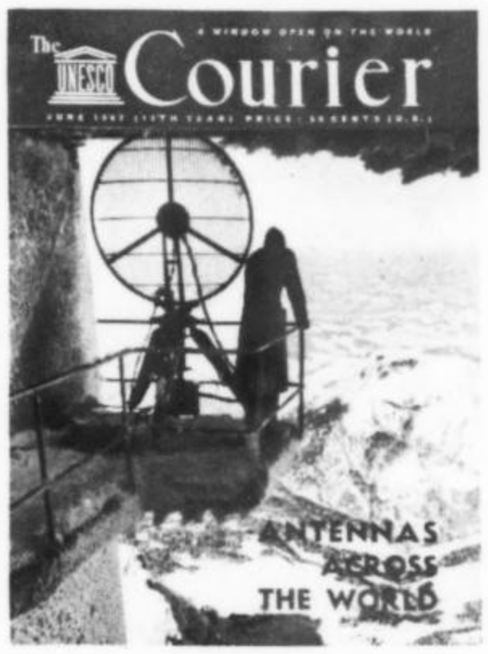
■ *Algeria has become the 107th member state of* UNESCO. *A short time before,* UNESCO'S *Executive Board approved a $200,000 emergency assistance programme for Algeria to be used to provide teachers for secondary and technical education.*

■ *Import duties on radio, film and television equipment, scientific instruments and other information materials have been reduced by 16 nations at the Tariff Conference of the GATT (General Agreement on Tariffs and Trade) held recently in Geneva.*

■ *Malaya is to have its first national news agency—through the combined efforts of its newspapers, radio broadcasting organizations and other information enterprises—following a* UNESCO *meeting in Bangkok on the development of national news agencies in the Asian region.*

■ *At least $80 million will be needed to develop public libraries in Africa between now and 1970 according to library specialists from 28 countries at a seminar organized by the Government of Nigeria and* UNESCO *at Enugu, Eastern Nigeria.*

CONTENTS OF THE UNESCO COURIER 1962



January

ANTARCTICA, INTERNATIONAL LAND OF SCIENCE. Frozen continent of many paradoxes — The two faces of Antarctica — Antarctica. International Land of Science — Discovery, exploration, adventure and courage — Trail blazers of Antarctica — Amundsen and Scott — Living at 70 degrees below zero — Of sunspots, magnetic rings and polar lights — Journey into the inaccessible — Unique species threatened by man.

February

THE RUINS OF NEMRUD DAGH. 2,000 years ago East met West at the shrine of Antiochus I — Frederick Douglass, American fighter for freedom — The Incas of today — Ping-pong dolls go to school — Australia's giant ' eye ' on outer space — Little-known masterpieces of Bulgarian art.

March

THE AWAKENING AFRICAN CINEMA. The art of **seeing** a film — Africa : The awakening cinema — Tomorrow's weather — The story of the metric system — Computer deciphers Maya hieroglyphs.

April

TWO FACES OF WORLD HEALTH. A special report : The challenge of disease and poverty ; Hazards of progress and prosperity — An S.O.S. from cableman to fisherman — Translators, words and things — Students abroad in search of knowledge.

May

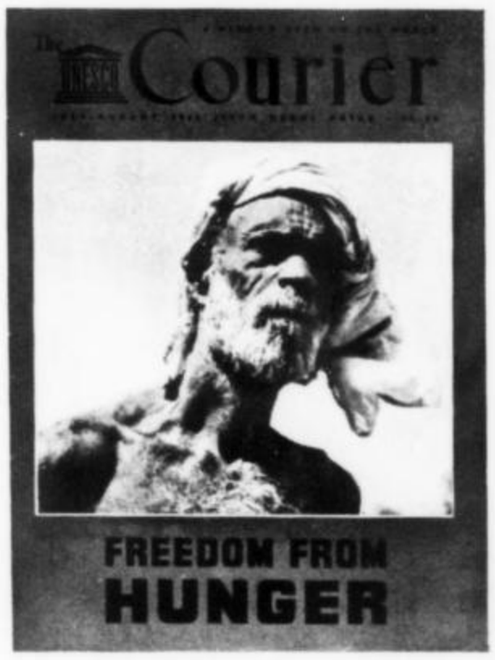
THIRSTY LANDS, PAST AND FUTURE, The thousand faces of the 'desert' — Strategy of scientific co-operation — When the Sahara was a blooming garden — The Emperor Penguin, monarch of Antarctica — The lost hymns of Georgia — Modern Japanese fiction — Reminiscences by a friend of Tagore.

June

ANTENNAS ACROSS THE WORLD. 2,000 million people without access to news — Global facts and figures — A scientist looks at popularization — Kalinga Prize goes to space-age writer — Paul Geheeb : Search for a new humanism — Bold reformer and a school for mankind — Music of the orient — Latest panorama of world's translations.

July - August

FREEDOM FROM HUNGER. World campaign against hunger — The challenge of hunger — Famine, the greatest scourge of history — Hidden hunger — Maps of hunger — Food taboos and prejudices — The food destroyers — Food and people — The first victories — A world strategy for surplus stocks — The anatomy of underdevelopment (Pt I) — Waking the sleeping lands.



September

DANGER : OIL-POLLUTED SEAS. Music on a string — Growing threat of oil pollution from the sea — The ocean under a microscope — The anatomy of underdevelopment (Pt 2) — Gerhart Hauptmann, dramatist of the oppressed — How to be an amateur archæologist — Jodo Kumami, king of storytellers for Kyoto's children.

October

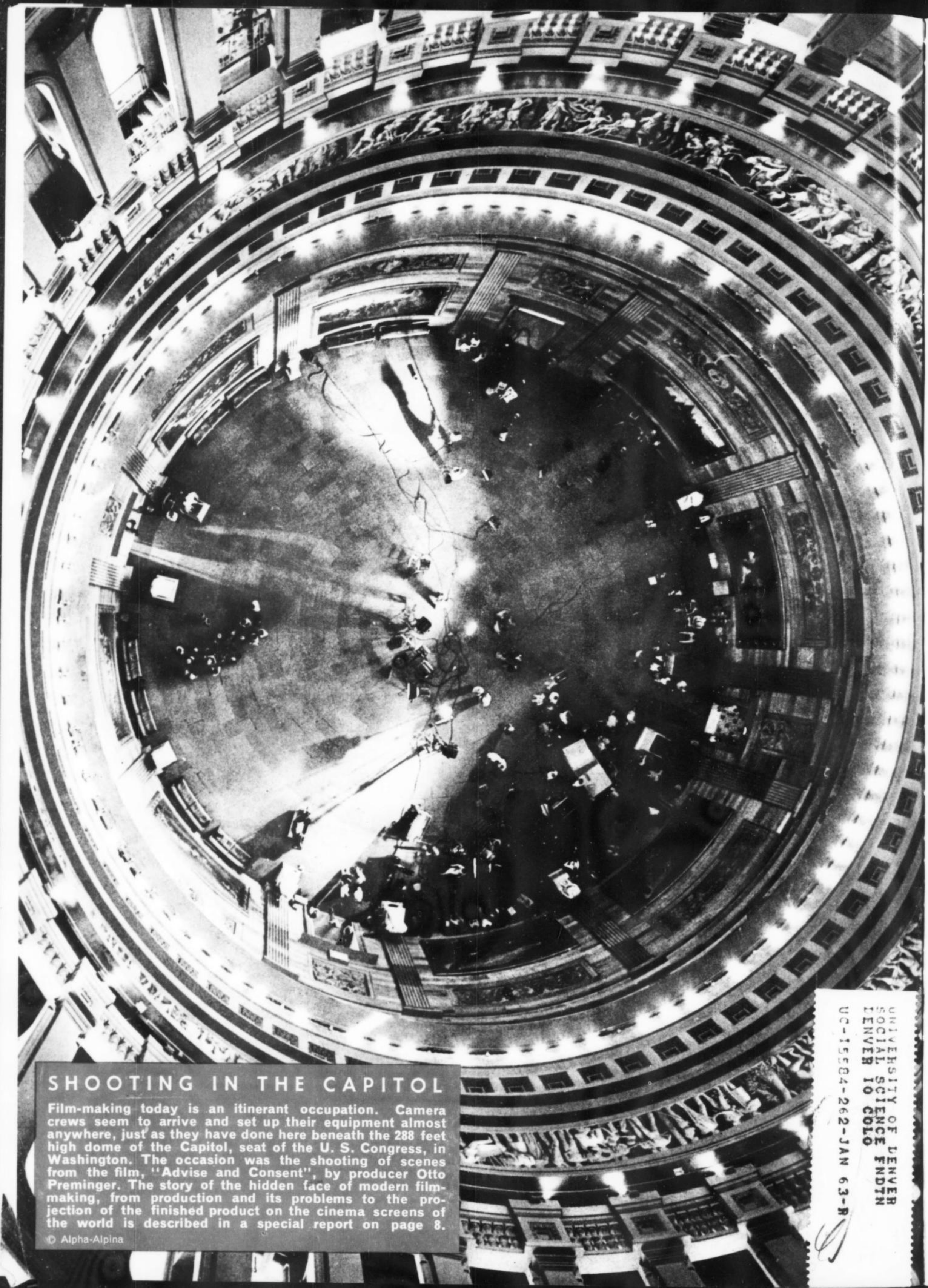
NATURE'S HIDDEN LANGUAGES OF SMELL. Karl von Frisch on the surprising uses of smell sense by animals — Rameses' mysterious encounter at dawn — Niko Pirosmani — Building a future for young Arab refugees — Will the Indian Ocean reveal its secrets ?

November

NEW HORIZONS IN MUSIC. Society calls the tune — Music sketch book — In defence of science-fiction — Digging for history — Unicef greeting cards — The anatomy of underdevelopment (Pt 3) — World pioneers of technology.

December

MAN THROUGH HIS ART. Earthlings in the Space age — Auguste Rodin and " The Citizens of Calais " — Man Through His Art — The deadly salt of the earth — Samarkand the fabulous — The hidden face of the cinema.



SHOOTING IN THE CAPITOL

Film-making today is an itinerant occupation. Camera crews seem to arrive and set up their equipment almost anywhere, just as they have done here beneath the 288 feet high dome of the Capitol, seat of the U. S. Congress, in Washington. The occasion was the shooting of scenes from the film, "Advise and Consent", by producer Otto Preminger. The story of the hidden face of modern film-making, from production and its problems to the projection of the finished product on the cinema screens of the world is described in a special report on page 8.

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